The Builder.

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ILLUSTRATIONS.

A Christmas Vision: after Tennyson.....Drawn by Mr. A. C. Conrade.
Interior, St. James's, Piccadilly (R.A. Prize Drawing).....Drawn by Mr. Leslie Wilkinson.
New Grammar School, Marlborough.....Messrs. Silcock & Reay, Architects.
Holy Trinity Church, Southport.....Messrs. Matear & Simon, Architects.
Rectory, Oxted, Surrey.....Mr. C. M. Oldrid Scott, Architect.
Memorial Gateway, Monton Church, Manchester.....Messrs. T. Worthington & Son, Architects.

CONTENTS.

	PAGE
A Note on Street Architecture	653
The Care of Ancient Monuments	654
Notes	656
Bromley Municipal Buildings Competition	657
Engineering Features of the London Coliseum	658
The Royal Institute of British Architects	659
Street Architecture	661
The British Association of Waterworks Engineers	663
The Post Office London Directory	664
Diaries, etc.	664
The London County Council	664
Applications under the 1894 Building Act	665
Architectural Societies	666
Archæological Societies	667
The Tramway and Light Railway Association	667
Westminster City Council	668
Court of Common Council	668
Illustrations :—	PAGE
A Christmas Vision: after Tennyson	668
Interior, St. James's, Piccadilly	668
Grammar School, Marlborough	668
Holy Trinity Church, Southport	668
New Rectory, Oxted, Surrey	669
Memorial Gateway, Monton Church, near Manchester	669
Competitions	669
Books Received	669
Correspondence :—	
Architects' Drawings	669
The Joinery Trade	670
New Wesleyan Methodist Hall Competition	670
The Student's Column	670
"Student's Column" Papers on Portland Cement	672
Obituary	672
General Building News	672
Sanitary and Engineering News	673
Miscellaneous	674
Capital and Labour	674
Legal :—	
The Chailey Rural District Council v. Sir W. Grantham	674
Case under the London Building Act, 1894	675
Case under the Public Health Act, 1875	675
Acton Ancient Light Dispute	675
Action by an Architect	675
Action by Building Owner against Architect	676
Altering Leasehold Premises without Lessors' Permission	676
Workmen and the Check System	676
Patents	676
Some Recent Sales	677
Prices Current	678
Tenders	679

A Note on Street Architecture.

THE paper on "Street Architecture" read by Mr. T. G. Jackson at the Society of Arts, a report of which will be found on page 661, was of much more value than the discussion which followed it; but the paper and the discussion together suggest one or two points for special consideration.

The often-vexed question of grouping and symmetrical design in street architecture, as against the effect of individuality, or independent treatment for each property, naturally comes up once more; and we are glad to find that Mr. Jackson recognises the importance of symmetrical architectural treatment, if he does not advocate it in all cases, and he commented strongly on the manner in which the design of Regent-street, "the one fine and consistent piece of street architecture in London," has been practically destroyed by the intrusive alterations which have been permitted to be made in it. To call Regent-street, in its original state, "fine" architecture is what we should hesitate to do *sans phrase*, but "consistent" at all events it was, and has now ceased to be so, and people are beginning to find, when it is too late, that they have destroyed something which was of architectural value to London. Regent-street would have been respected had it existed in Paris. An owner of one or two houses in the Place Vendôme wished some little time ago to raise them, thereby spoiling the architectural design of the square: he was not allowed to do so.

Our own opinion is that massing of street architecture, if not for a whole street, at all events in large blocks, in a symmetrical design, is an almost necessary expedient if the highest dignity is to be given to the architecture of a city. It is owing to the prevalence of this symmetrical street architecture that Paris has that grandiose air which makes it seem a city so much more, in the full sense of the word, than our own capital. Of course it may be said that the Paris street architecture is somewhat cold and formal and wanting in variety; so it is, but something must be given up either for the picturesque on one side or the stately on another; and to our mind it is the stately element that is most proper to a capital city, at all events. The manner in which the County Council have let slip the opportunity for stately and symmetrical design in Aldwych and Kingsway, after laying the foundation for it by instituting a competition for designs, is absolutely lamentable. The mischief is done now in Aldwych, but there is still some place for repentance in regard to Kingsway.

The demand for special treatment and special material for shop front architecture was rather more emphasised by Mr. Jackson than we should have expected. He urged that was no reason why stanchions and bressummers should not be treated architecturally if there was an absolute demand for entirely glazed shop fronts; and this was naturally echoed by an eminent engineer present, who said that if architects were to meet the commercial requirements of the present day they must forget a great deal about Greek and Roman and Gothic architecture, which "was not suitable for modern commercial life"; and he defended iron construction by the examples of Southwark and Blackfriars bridges, which he appears to group together; whereas in fact Southwark is a fine and sober piece of actual construction, and the Blackfriars' spans are a piece of pretentious vulgarity. So much for engineering criticism of the æsthetic. We have heard all this of course, very often, but without being convinced. We do not think that steel bressummers and stanchions are capable of as much architectural effect as stone piers and arches, though we quite agree that if that glass ground-story is indispensable, the means of supporting the building above it should be openly shown, and treated in a way characteristic of the material; and it is too true that this is very seldom done at present, and we see arches or imaginary stone lintels, that could not possibly stand put up in order to comply with what are supposed to be the demands of architecture. That of course is all wrong; and visible steel structure is much better than sham stone structure. But after all, real stone structure is better than either; and whatever the "honesty" of the steel construction, we have still the disagreeable effect of the empty space as the base of an architectural design: But the question is, whether people are not getting hold of the whole matter the wrong way about. Is it really necessary to the prosperity of a shopkeeper that he should have the whole front of his shop scooped out and filled with plate glass? Is it not merely a superstition of the trading mind? And is it not possible to convert the shopkeeper to a perception that a dignified architectural masonry front, even if arched, is worth more to his trade than filling up the spandrels with glass?

THE CARE OF ANCIENT MONUMENTS.

(Concluded.)

By PROFESSOR BALDWIN BROWN.

WE now come to the question of formal Monument Acts passed by State Legislatures for the preservation of national treasures in the form of historical and artistic monuments. A list with dates of the principal European Acts of the kind was given in the first paper (*ante*, p. 594). There is no space to attempt a notice of them all, but it may be said generally that they differ according to the objects specially aimed at in the legislation. Thus, movable works of art are sometimes specially considered, and the aim is to prevent these being sold out of the country to the foreigner. This aim is prominent in Italian monument legislation, and the recent Act of 1902 of Canton Bern, in Switzerland, mentions in the preamble the too-frequent sale of works of art to the foreigner as one reason for legislation. Some countries, again, have to provide specially for the care of excavations and for the disposal of objects which these may bring to light. The Monument Act of 1881 for the kingdom of Hungary lays stress on these points. Other Acts again contemplate chiefly immovable objects, and are framed with a view to the preservation from injury of a certain special class of architectural and other monuments of outstanding importance that are entered in a schedule. This is the character of the British Ancient Monument Act of 1882 and of the fuller law passed in France in 1887. The most comprehensive of the recent measures is the one passed in the Grand Duchy of Hesse in 1902, but it is possible that when the projects for monument legislation now under consideration in Prussia, Austria, and Bavaria pass into law we shall have something still more complete and satisfactory. It is understood that the forthcoming Prussian Act will contain a provision for arming urban authorities with legal powers to give effect to æsthetic requirements.

A comparison of Monument Acts, however, and of drafts for such Acts, shows that in the more advanced countries of to-day it is not easy to carry through the legislature any very stringent provisions for the protection of monuments. Very many of these are in private ownership, and in advanced communities respect for the rights of private property is often elevated into a sort of fetish. Again, in such communities questions of public health and of convenience in the means of intercourse are of great importance, and in any conflict of interests that may arise between the new and the old, the ancient monument is too often sacrificed. Sir John Lubbock, now Lord Avebury, had to battle for ten years before he could pass the Act of 1882, mild as it is, because Parliamentary opponents cried out that the rights of private property were being invaded. Most modern Acts were more drastic in draft than in their final form, and the claims of the public interest in what are after all national possessions have had to be compromised in face of the opposition of the private lords of the soil. For downright uncompromising prohibitions we have to go to the Monument Acts of countries like Turkey, or some of the Danubian kingdoms. The French Act of 1887 has provisions framed especially for Algeria, and these are more severe than those applicable to the mother country. The French protectorate of Tunis has a Monument Act far more searching than the French people would have accepted for themselves.

It will be convenient to notice first of all this French law on historical monuments, which may be taken as sufficiently typical of other similar measures. It is not the most recent, nor the most comprehensive, nor most drastic, of European Acts of the kind, nor is it by any means faultless in content or expression, but it enjoys the prestige attaching to all the institutions connected with art in its favoured country.

The French law, like other such Acts, makes a distinction between monuments belonging to the State, or to public bodies over which the State has some control, and those in the hands of private corporations or individuals. A list has been drawn up by the Commission on Historical Monuments, in which an endeavour is made to schedule all those objects of historical or artistic interest that are held to be of national importance. The number of monuments actually thus scheduled, or, as the French say, "*classés*," is about 2,200, and of these about 308 are prehistoric monuments, such as dolmens or standing stones. The effect of this insertion in the schedule is that, in the words of the fourth article of the Act, "the monument that has been 'classed' cannot be destroyed even in part nor become the object of a work of restoration or repair, nor of any sort of alteration, unless the Minister of Public Instruction and of the Fine Arts has given his consent." It will be seen by this that complete protection is secured in the Act for the scheduled monuments, but it does not follow that this schedule includes everything in the country that is specially worth preserving. It is a provision of the Act that no monument can be "classed" without the consent of the body or individual that owns it. When the owner is a Government department or a public body, pressure can be brought to bear on it by the Council of State, so that consent to enrollment can practically always be obtained. In the case of the recalcitrant private proprietor, who will not allow a monument to be "classed," it is possible to proceed by the process of compulsory purchase or expropriation. This process had all along been available, for the general law in France allows of expropriation on grounds of public utility, and it had been officially recognised that considerations of art and of historic interest come under this head. Even before the passing of this Act of 1887 the weapon of compulsory purchase had been effectively used in favour of historic monuments, so the Act introduced in this matter no new principle, but only emphasised already existing provisions.

The main result of the French Monument Act, accordingly, is that it gives practical security to all monuments that belong to public bodies, while to those in private hands it opens the way to safety though through a course of procedure that is somewhat cumbrous as well as expensive. It is something, however, gained to a country when legislation has definitely ensured to it a method by which any national possession that may be actually upon private land can be, if that country choose, preserved to all future generations. In this island there is no such method, for the Government can only purchase monuments by agreement with the owner, and, in view of the portentous "dourness" exhibited (though not in connexion with monuments) by some British property-owners, one trembles to think what might happen to some monument of world wide value were war declared between a private proprietor and the public at large.

The two most important Monument Acts of more recent date than that of France are those passed in 1902 by the legislatures of Italy and of the Grand Duchy of Hesse. The main result of each of these Acts, so far as architectural monuments are concerned, is similar to that of the French Act. The Italian law, like Italian monument-legislation in general, devotes a good deal of attention to movable objects of artistic worth, the exportation of which from the country has always been a vexed question in the peninsula, and deals also in some detail with the State regulation of excavations and "finds." The Hessian law, over and above the main provisions, has some of a novel character that represent an advance in monument legislation. Conspicuous among these is the clause empowering the State to delegate to local bodies the right of expropriation in the interests of monuments which belongs to it. Other provisions of the kind relate to the protection of natural sites, the control of the advertisement-fiend, etc. It will be well to analyse this Act somewhat at length as one of the last official utterances on monument administration.

The Hessian law is rendered all the more instructive by the fact that the author of it, Freiherr von Biegeleben, gave a full account of it to the German Monument Congresses of 1901 and 1902, and explained the difficulties which had to be encountered and the changes which the draft underwent in its passage through the Legislature. He has also reported more recently on its satisfactory working to the Congress held at Mainz in September, 1904.

The Act, which came into force on October 1, 1902, falls into seven sections and contains thirty-nine articles; each of the main and subsidiary divisions has a useful heading. The first section, articles 1 to 8, is concerned with monuments in the possession of corporations and public bodies, and the expression "monuments" includes movable objects as well as architectural structures, and takes in documents as well as works of art. These bodies are forbidden not only to destroy or alienate any monument in their possession, but to effect on it any alterations or restorations without previously obtaining the permission of the authorities, such permission being given or withheld upon considerations of an artistic or historical kind. Alterations in the adjuncts or surroundings of a monument are included

in this provision. The authorities in question are the "Kreisamt," perhaps roughly corresponding to our County Councils, and there are appeals to higher bodies up to the Minister of the Interior. On the "Kreisamt" is enjoined the duty of drawing up an inventory of all monuments belonging to public bodies within its district.

The second section, articles 9 to 17, is concerned with monuments in the possession of private persons. Movable objects in such ownership are excluded from the operation of the Act, and with regard to other (architectural) monuments, only those are protected which are included in an official list. The task of drawing up this list or schedule (which is quite distinct from the mere inventory kept by the "Kreisamt") is in the hands of a Council on Monuments ("Denkmalrath"), the constitution of which is defined in article 32 of the Act. It is called together by the Minister of the Interior, and consists of representatives of the Catholic and Protestant churches, at least two members of the Hessian antiquarian, historical, or artistic societies, and two resident Hessian owners of architectural monuments. A private proprietor of a monument must be informed when it is in this way scheduled, and is allowed to appeal against the inclusion to the Minister of the Interior. Any proposed alienation, alteration, or restoration of a scheduled monument in private hands must be reported to the "Denkmalpfleger," that is, the general Conservator of monuments for the State at large, and, unless the proprietor receives official sanction, he is bound to take no steps involving a carrying-out of the proposal till six weeks have elapsed. During that interval, if the proposal seem to involve danger to the monument, the Conservator has to exercise what moral pressure he can on the proprietor to induce him to modify his intentions, and, to give time for this, the Minister of the Interior may prolong the period of six weeks to one of three months. In case of a proposal on the part of the proprietor to destroy the monument or to alter injuriously its surroundings, permission must be asked either from the "Kreisamt" or from the "Denkmalpfleger." If permission be refused, the proprietor may appeal to the Minister of the Interior within a period of four weeks, to which no extension can be allowed. If the answer to the request for permission be not sent within a space of six weeks (which the Minister can extend to three months), then the proprietor is allowed to carry out his original proposal. In case the permission be refused or only granted partially, and the appeal to the Minister of the Interior be rejected, then the proprietor can within six weeks claim compensation from the Minister for the curtailment of his rights of disposal over his property, or can call upon the State to acquire the monument or its surroundings at a valuation.

Section three, articles 18 to 24, deals with special cases. Article 19, entitled "*Right of Expropriation in the Interest of Monuments*," is of enough importance to be quoted in full.

"The State is authorised to limit the rights of private property in land to such an extent as is needful:—

"(1) To secure the preservation of an architectural monument, the maintenance or security of which is being neglected in such a manner as to endanger its existence or the upkeep of essential parts of it; or

"(2) To effect such an opening out of a monument as is demanded by artistic or historical considerations, provided that no overpowering public or private interest come in the way.

"The proprietor, in so far as circumstances make this reasonable, may demand, in place of the limitation of his rights, their entire acquisition by the State.

"The State is empowered, by a rescript of the Minister of the Interior, to transfer the right of expropriation given to it in the first paragraph of this article to the commune, the district, or the province, in which the architectural monument is situated." (This last provision has been already referred to as a novel and important one.)

Other articles of this section secure to the State the right of visitation and of making plans and drawings of monuments, and the right of ordering a proper expenditure on monuments on the part of public bodies that own them.

Article 23 provides that any projected road or railway line that threatens the existence or amenity of a monument shall not be made without leave of the Minister of the Interior. Also that, in the interest of the amenity of an architectural monument, local regulations may be made to prevent new buildings being erected within a certain distance of it, or the buildings in its vicinity being raised above a certain height.

The fourth section, articles 25 to 30, is concerned with the question of excavations and "finds." The former cannot be undertaken without previous notice to the authorities; the latter must immediately be announced to the burgomaster or "Kreisamt" of the locality.

Land may be expropriated for the purpose of carrying on excavations.

The fifth section, articles 31 and 32, deals with the organisation of the bureau for the care of monuments, etc.

Section six, articles 33 to 36, introduces us to a new and interesting feature in Monument Acts, the care of "Naturdenkmäler," or natural scenes and objects. Article 33 begins as follows:—

"Natural phenomena of the earth's surface, such as watercourses, rocks, trees, and the like, the maintenance of which is a matter of public interest on grounds of history or of natural history, or from considerations of the beauty or special character of a landscape (natural monuments) can be placed under a special protection to be exercised by the 'Kreisamt' on the demand of the Department of Forests, etc., in the Ministry of Finance.

"This protection can be extended to the surroundings of a natural monument."

The owner, be it a public body or a private person, is to be informed that the natural monument is scheduled, and can appeal, as in the case of the monuments referred to in previous sections.

Article 34 continues:—

"Operations which threaten the continued existence of a natural monument that is officially protected, or promise to injure either this or its officially protected environment, can only be carried out after the permission of the 'Kreisamt' has previously been obtained.

"Such permission is to be refused when the proposed operations give rise to apprehensions in respect to the maintenance of the monument, or to considerations of the kind referred to in article 33, and when such apprehensions outweigh the public or private interests that may be injuriously affected by the refusal."

Article 35 will appeal to the sorely-tried British lover of amenity and quiet.

"*Prohibition of Advertisements, Posters, etc.*

"On a natural monument officially protected, or in its officially protected environment, no advertisements, nor the like, nor objects such as posters shall be placed or set up of such a kind as to injure the effect of the monument.

"At the bidding of the 'Kreisamt,' advertisements, or objects of the kind referred to, which at the time of the promulgation of this Act are already in existence, must be removed. The proprietor can demand from the State an indemnification for the loss sustained by him through the removal of what he had put up.

"It shall be competent for district authorities, through local police regulations, to forbid the importation or display of advertisements, etc., or of objects which in localities of great natural beauty are injurious to the landscape; and, further, to direct the removal of those already in existence at the localities in question."

In the seventh and last section, articles 37 to 39, there are provisions for penalties for breach of the Act. These are fines up to 50*l.* or imprisonment.

The provisions of our own Ancient Monument Act of 1882 are probably sufficiently well known to make any analysis unnecessary. It was based upon a schedule embracing sixty-nine monuments, all but seven of which were of the prehistoric class, to which seventeen or eighteen others have since been added. Under the Act, the Commissioners of Works, who have the administration of it, can punish anyone but the owner who injures or defaces any scheduled monument. An owner may, if he choose, constitute the Commissioners guardians of any ancient monument in his possession, and in that case he is no longer able to work his own will upon it. By arrangement, the Commissioners may become the owners of the monument, but there is no power from their side of compulsory purchase. The Commissioners are now guardians of about forty monuments, but they have never actually purchased any. Very little money has been laid out by them on the monuments in their guardianship.

In Ireland, ancient monuments are much better off, and the danger here is that they may receive only too much attention at the hands of well-meaning "restorers." When the Irish Church Act was passed in 1869 there was a clause added by which ruined or disused places

of worship that had a historical or artistic interest were handed over to the care of the Irish Commissioners of Works, and a sum of money amounting to 50,000*l.* was set apart for their maintenance. Furthermore, in 1892, a special Monument Act was passed for Ireland enabling the Commissioners to apply the Act of 1882 to other structures of interest, besides those of the prehistoric or sculptured-stone classes to which its operations were at first confined. The result has been that the Irish Commissioners of Works now rejoice in the guardianship of no fewer than 189 ancient and national monuments, and spend upon them the handsome sum of about 1,000*l.* a year.

In the year 1900 a very distinct advance was made in the official care of monuments in Great Britain. By a short amendment-Act, the functions with regard to monuments previously in the sole hands of the Commissioners of Works were extended to County Councils, who were empowered to purchase by agreement or become the guardians of any monument possessed of historic, traditional, or artistic interest. This provision is of the best promise for the future, as introducing the decentralising process in monument administration, which has been adopted with good effect both in Italy and Germany. There is another clause to the effect that Commissioners of Works or County Councils may receive voluntary contributions towards the upkeep of any monument under their charge, and enter into an agreement with an owner or "any other person" as to its "maintenance and preservation, and the cost thereof." This, again, is a most promising stipulation, as it brings official authorities into touch with private societies, such as the "National Trust," as well as with individuals who may take special personal or local interest in some monument or group. This common action of the official and the private agencies is of the utmost importance for a healthy "Care of Ancient Monuments" such as we may hope to see established in our own country in the near future.

NOTES.

The Venice Campanile.

ACCORDING to a recent report, work is proceeding slowly and carefully on the foundation for the new Campanile at Venice. The authorities have wisely decided to leave the old foundation undisturbed but to surround it by a belt of concrete supported on piles. This belt will be 15 ft. wide, and the necessary excavation has already been completed. The trench is lined with sheet piling, and 8 in. square piles are now being driven close together in the bottom. The progress of every pile is carefully watched, and driving is stopped immediately a satisfactory bearing is obtained. We understand that a grillage will be formed over the heads of the piles so as to provide for uniform distribution of the load. Examination of the old foundation revealed the fact that the centre portion had been filled in with loose stones, about 6 in. or 7 in. square. Thus, the original footings formed a hollow square, transmitting the load due to the superstructure directly to the supporting piles. The present condition of the foundation testifies to the correct judgment of its designers, as the collapse of the tower demonstrates the danger of tampering with ancient masonry structures after the manner followed at Venice in the XVIth and XVIIIth centuries.

London Fogs.

CONSIDERING its position and meteorological conditions, it is morally certain that London must always be subject to fogs, even if coal fires were entirely abolished. The substitution of purified gas for coal as a source of heat would certainly reduce the blackness, density, and irritant effect of fogs, and the universal adoption of electricity as a source of light and heat would be still more beneficial, but could not obviate the formation of white fogs—cold, damp, and laden with carbonic acid gas and other objectionable vapours. As remedial measures on a comprehensive scale are out of the question, Londoners must be resigned to their fate, and the most practical course of action at the present time is to inquire more fully into the possibility of forecasting fogs for the guidance of electric lighting authorities, railway companies, and the travelling public. Some useful work in this direction has already been done by the Meteorological Council, whose recent Report is an interesting and instructive document. So far, however, it appears unlikely that it will be possible to derive a warning for one district of the metropolis from the observation of actual fogs in other districts, although the hope is held out that such warnings may be afforded by special readings of thermometers and barometric instruments. Further investigation is still necessary, but the conduct of this involves expenditure, which the Meteorological Council cannot undertake with the limited means placed at its disposal.

The Law of Light.

THE important case of Kine *v.* Jolly, which was the subject of an article in our issue of September 3, has been carried to the Court of Appeal. It will be remembered that the action was brought in respect of obstruction of light to three rooms, that the judge decided there was such an obstruction to the light of the morning-room as to amount to nuisance in that the room had lost its characteristic cheerfulness, and that this, taken in conjunction with the loss of light to the hall, entitled the plaintiff to a mandatory injunction. We discussed the case fully in our former article, and we commented on the fact that the learned judge had granted an injunction since it appeared to be a case in which, according to the *dicta* of the House of Lords in Colls *v.* Home and Colonial Stores, the remedy should have been damages. The Court of Appeal have now varied the judgment of the Court below to this effect. It is, however, noteworthy that, while the majority of the Court upheld the finding of Mr. Justice Kekewich that there was a sensible interference with the comfort and convenience of the house as a dwelling house amounting to nuisance, Lord Justice Romer dissented and failed to see any nuisance since the finding of fact was that the morning-room remained a well-lighted room. This case, therefore, leaves the question of what is the test to be applied in such cases as to the existence of nuisance still undetermined.

The New York Rapid Transit Subway.

ALTHOUGH the new underground railway of New York has only been opened for a few weeks, considerable complaint is made as to the unpleasant character of the air. Americans are not generally prone to criticise their national works in any adverse spirit, and in the technical press there appears to be an effort to explain away the close and disagreeable condition of the atmosphere in the new subway. We are told that ferry boats across the East River are more offensive, that Pullman trains are as stuffy, and that so long as unwashed people travel in closed cars the air will not be agreeable to persons of delicate sensibilities. Comments of this kind are simply evasions of the main question. Further, we are informed that there are so many large openings into the subway and so many trains to act as pistons in moving the air that it will be difficult to convince any engineer that the air is really so bad as to render special ventilation necessary. This is just the same sort of argument that was used in London after the opening of the City and South London and the Central London railways, but in point of fact the air grew steadily worse in each of these tubular lines. Our American friends will have to face the position and profit by experience on this side of the Atlantic. In this connexion we may say that atmospheric tests are already being made by Professor Chandler, and it is said by one hopeful writer that so far as they have gone the tests indicate "the air of the subway to be entirely satisfactory." We shall be interested to notice what they show after completion, and if the results prove quite satisfactory we shall be pleasantly surprised.

Union Bridge, Aberdeen.

WE hear that it is being found necessary to widen Union Bridge, Aberdeen, which was built in the first years of last century to connect the old town and the new across the deep depression or valley called Denburn, and give access to Union-street. The bridge is a fine work in the dignified and severe classic style in which new Aberdeen was mostly carried out. Both Rennie and Telford were consulted about it and made designs, and the actual design is probably Telford's, from the documentary evidence, though the appearance and treatment of the arch remind one strongly of Rennie's work at London Bridge. A local history which has been published claims it for a local man, Fletcher by name; but this is very doubtful, as it is known that Fletcher proposed a balustrade of Gothic arches, while every detail in the bridge as carried out is the severest classic. It is odd that the width of the bridge, at first intended to be 50 ft., was reduced to 40 ft., not only for economy, but because "it would tend much to beautify it." Had the first intended width been retained, it would probably not now be necessary to widen it. We hope nothing will be done to interfere in any way with its original severe and monumental character.

Test of a Large Concrete-Steel Beam.

A CONCRETE-STEEL beam, having the unusually long span of 55 ft. between supports, forms the chief support of the gallery in the New Lyric Theatre in Cleveland, U.S.A. This beam has a T-section, the upper flange measuring 20 in. wide by 10 in. deep, and the vertical leg 12 in. wide by 50 in. deep, the total depth of the beam being 60 in. The concrete used was mixed in the proportions of 1 part Portland cement, 2 parts river sand, and 4 parts silica gravel, and the reinforcement consists of seventeen longitudinal round bars in the tension and compression areas, in addition to stiffening bars for resisting any tendency to buckling, and 400 stirrups of different sizes for resisting shearing stresses. An interesting feature is that the beam is separately supported on concrete-steel columns, and thus no part of its weight comes upon the rest of the building. Owing to the small area presented by the upper surface of the beam and the great weight necessary for testing it was decided to adopt the novel device of applying the test load by hanging a platform from a limited portion of the beam on either side of the central point. The platform was laden with pig-iron up to the maximum load of 44 tons. No deflection was observed on the application of the first 4 tons, but beyond this load deflection commenced and increased at the rate of about $\frac{1}{64}$ in. per ton of load, the total deflection for the maximum test load being $\frac{18}{32}$ in. It is satisfactory to note that close examination revealed no evidence of cracks in the concrete, and the architects are to be congratulated upon the success attending this bold example of construction.

Dust Destructors and Electric Lighting.

THE paper recently read by Mr. W. P. Adams to the Institution of Electrical Engineers is of general interest, as well as being of great value to electricians. He discusses in a very able manner the question of the combination of dust destructors with electricity works. In a lecture to the Society of Arts, given twelve years ago, Professor G. Forbes stated that if all the refuse then collected in Paddington were properly burnt and used in the most economical way, it would provide enough electricity to light one 8-candle power lamp for two hours every night of the year for each of the inhabitants. We learn from this paper that the results obtained at Hackney and Fulham practically do this already, and in a few years even better results will be obtained. Mr. Adams calculates that approximately one million tons of refuse are collected every year in London, most of which is taken out to sea by barges at considerable expense to the ratepayer. On a moderate estimate, the value of the potential capacity of this refuse for steam raising for electric engines is 100,000*l.* per annum. We think the author has proved that, with the improved dust destructors now in use, there is a substantial gain, in most cases, in combining dust destructor and electricity works. The exceptional cases are when the refuse has a very low calorific value. At Llandudno and at Royton in Lancashire, for example, the refuse is of little use for steam raising. It is curious to note that the dust of greatest calorific value comes from poor neighbourhoods. At Bermondsey its value is particularly high. Mr. Adams suggests that the explanation is that the working classes, unlike the middle classes, rarely sift their ashes. In considering the question of dust destructors, the first point to be settled by municipalities, therefore, is the heating value of the refuse collected. This can be determined experimentally without much difficulty, and the value remains wonderfully constant in a given neighbourhood. The revenue earned by a dust destructor is due mainly to the supply of steam to the electricity works, but this steam can be sold for many other purposes as well.

Portland Cement.

IN a paper recently read before the Civil and Mechanical Engineers' Society, Mr. H. E. Bellamy presented a useful series of notes upon Portland cement, embodying therein some of the experience gained during the execution of works in Queensland, which necessitated the use of several thousands of casks of cement. There is a strong family resemblance among all papers and articles dealing with the material in question, and the chief claim of the communication to which we now refer appears to be that it sets forth the views and conclusions of an engineer who, in the capacity of a purchaser and user, has been obliged to examine and compare numerous descriptions of cement made in England, America, Germany, and in Australia. A point of some importance to British cement manufacturers is that surprising quantities of foreign cements find their way into the Colonies, owing to their high tensile resistance and rapidity of setting. While pointing out the objection to abnormally high tensile results, the author speaks in terms of approval with regard to cement having the property of setting quickly. We feel certain that the best English cements are unsurpassed by any of foreign make, and that the results they give in testing are notably uniform and constant; but if users in the Colonies desire a product having certain distinctive characteristics, it is clearly worth while for our manufacturers to comply with these. If they do not, foreigners will continue to obtain undue advantage in purely British markets.

Sheffield Sewage Works.

AN inquiry was held at Sheffield last week by Mr. A. A. G. Malet and Dr. Theodore Thomson, on behalf of the Local Government Board, the purport of the inquiry being the city's proposal to borrow 300,000*l.* for new works of sewerage and sewage disposal. Nearly the whole of the money is required for the sewage disposal works. The evidence showed that the existing works were completed as recently as 1887 at a cost (including intercepting sewers) of nearly 200,000*l.*, and the Town Clerk (Mr. Sayer) had evidently determined that the two Commissioners should not fail to learn the part played by the Local Government Board in the preparation of the scheme of precipitation by lime which was then adopted and which has since been condemned by the Board. "The Local Government Board," he said, "approved the plans for the precipitation works in every respect and made various suggestions in regard to them," and also "referred several municipalities, including Glasgow and Manchester, to the Sheffield works as an example of the best method of dealing with sewage." It would seem unkind of the Town Clerk to hint that the Local Government Board is not infallible, but the hint is evidently designed to prevent (if that be possible) the new Commissioners from repeating the mistake of suggesting any improvement in a scheme recommended by the city of Sheffield. That there is, or was, a possibility of the hint being disregarded is shown by the Commissioners' evident reluctance to accept the opinions of the witnesses that single contact-bed treatment, after preliminary sedimentation and settlement, would produce a satisfactory effluent. It is, at any rate, a sign of the times that a city with a population of over 400,000 and a great variety of industries should ask the Local Government Board to sanction a scheme of bacterial treatment pure and simple.

Architects' Drawings.

WE hope all who are practically interested in this question will read the spirited letter of "A Provincial Architect" published under the head of "Correspondence" in this issue. Although all architects appear to be agreed on the principle of the matter, a good many seem to be very much wanting in spirit and determination in resisting the claims made. Mr. Hayward's and Mr. Hubbard's letters also may be studied with advantage. If architects and architectural representative societies stand by each other and show a firm front, something will probably be done to amend the law or its application; but nothing will be accomplished by a half-hearted policy.

BROMLEY MUNICIPAL BUILDINGS COMPETITION.

THE Borough of Bromley, in Kent, having reached a stage when it is necessary to extend its municipal offices, has secured land for the erection of various administrative departments, and the new Council Offices and Court House, for which competitive designs were on view on December 19, will form the nucleus of the general scheme. We were favoured with an opportunity of inspecting the forty-three sets of drawings (crowded together in badly-lighted rooms), amongst which much excellent work is to be seen.

Mr. J. S. Gibson, F.R.I.B.A., was the assessor, with whose selection of first place we are in agreement; we cannot say, however, that we approve of the choice of the four premiated designs.

The accommodation asked for is that usual for municipal offices, with the addition of a large education department and county court with accessory rooms. The site is an open one fronting three streets, and the cost of the buildings is limited to 20,000*l.*

Mr. R. F. Atkinson, of London, is awarded first place for what is a simple, straightforward plan, in which the buildings front the three roads, leaving a clear space in the middle of the site. The design of the main elevation, in brick and stone, is very suited to the suburban character of the borough; no perspective is submitted. The matter of future extension is well considered. The principal entrance and staircase occupy the central position on the main façade, leading up to the council chamber on the first floor, which overlooks the interior of the site. Corridors and entrances

are well arranged. In criticising the design, we should say that certain improvements can be effected with slight alteration. We do not like the rates office being approached from the main entrance hall, as there is always considerable traffic in this department. Most of the officials' private rooms have fireplaces, but the overseer, rate collector, and borough accountant surely deserve equal consideration? The staff lavatories are placed at the south extremity of the offices, which is anything but convenient and entails great loss of time. The councillors' conveniences, on the first floor, are quite separated from the robing-rooms, involving the traversing of the main corridor. Two doors into the council chamber would be found better than one, and the public gallery, which occupies a lateral position, would become a mere passage when the future extension, indicated by the author, is made. This gallery will be very useful for ventilating the chamber! The caretaker's apartments, although of no great importance, need careful revision; the ill-lighted corridor, the absence of coal-place, the south light to the larder, and the top-lighted bedroom are points which suggest hurried planning. These, however, are not insuperable blemishes in a scheme of which the merits are simplicity of plan and moderation in cost.

Messrs. H. Ashley & Winton Newman, placed second, send a design, illustrated by a well-drawn perspective, in which a good stone central part, crowned by the lead dome of the council chamber, takes a very satisfactory place with the brick and stone wings; the latter, however, are feeble. The plan is on the lines of the successful design, but the public gallery staircase and staff lavatories are in much better positions.

The design awarded third place, by Mr. G. H. Norton, is ⊥-shaped in plan, having the head to the main road, and a central corridor throughout the body of the figure. This corridor is wholly top-lighted. The future extension, as indicated, would ruin the lighting of the offices already built. Placing the caretaker in the basement at such an open site as most unhappy. The four doors in the council chamber would constitute an annoyance to its occupants. Although the main front has dignity, there is much wasteful planning in the offices and vaulted corridors.

Messrs. Hall & Phillips are awarded fourth place for a plan which shows a completed scheme; if built to suit initial requirements, however, the elevations would have very irregular forms. A wide mass of buildings is contrived with two large internal areas, and the council chamber and county court have internal situations. This is a wise provision in a noisy town, but hardly necessary at Bromley; moreover, it involves wasteful entrances and corridors for officials, public, and prisoners. The abruptness of the central stone features of the main front is unsatisfactory, and the authors wisely submit only a part-perspective.

The fifth premiated design, by Messrs. Lanchester & Rickards, has a very compact plan with the various departments arranged in a square, thus forming a large internal area. This compression forces the sanitary inspector's private and public offices into a basement lighted from an external area and approached by a small staircase. The council chamber is placed above the main entrance and appears to be too large for its purpose. The Mayor's seat is in a kind of bay-window, which is carried down to the ground-floor, forming the chief projection of the front. The external appearance is of a heavily-moulded nature devoid of any dignified proportion and commonplace in its use of features. The lighting of the entrance hall is not satisfactory. The police-court is square in shape, with the bench placed in a large recess; the plans do not indicate an outside entrance for magistrates or for prisoners. This scheme does not lend itself for convenient future extension.

Of the remaining designs the following are some of the more successful, the names of the authors not being disclosed. A good pencil perspective view illustrates design No. 42, which in grouping somewhat resembles the accepted scheme, and is an excellent brick and stone building. The lighting of the council chamber, the limited provision for doors, and the many top-lighted rooms next the county court are not good points.

No. 32 follows the general arrangement, except that the education department is placed on the south boundary with the corridor next the town hall site, so that it may be used when that building is erected; but the plan errs in the extent of its corridor space. The ground floor accommodation for the caretaker, who will be enabled to study the backs of the office buildings, and have full enjoyment of the main entrance on Sundays, is poor. By scheming important offices on both sides of an unlighted corridor No. 43 destroys all chance of success in a building of this order. There is no object in closing up the same corridor on the first floor with doors, but this is only one of other impossible ideas which a respectable elevation does not warrant.

No. 41 is a simple and, in many ways, an admirable plan; but the council chamber has too much outside wall, and the attempt to reconcile its external expression with that of the town clerk's rooms is one of its defects. No. 14 has a large mass of building necessitating two long top-lighted corridors—an arrangement suited to a scheme double the size in a large town.

A design deserving a premiated place is No. 24, which is illustrated by charming drawings. The plan is symmetrical, having two large internal areas, while future extension is intended to be placed above the two side wings. Here lies the cause of the wasteful nature of the initial form of the buildings, but the general idea is excellent. It is pleasing to find an overhanging eaves, as shown in No. 36, in place of the usual cornice or parapet; this elevation, however, would be all the better for a heavier centre in place of the twin hips lying behind a small pedimented stone feature. The plan is poor; the idea of compelling councillors to enter and escape from their lavatories direct from the council chamber is very bad.

The chief defects in an excellent scheme numbered 35 are the change of level between the mayor's and councillors' robing-rooms and the council chamber; the necessity of the caretaker and his family to use the grand staircase from the first floor level downwards and to keep the perambulator in the main entrance. In spite of these blemishes the design deserved a better fate.

No. 18 is perhaps the best elevation in the competition; the plan is economical, in that the council chamber is placed above the county court. The oblong form and single entrance to the chamber, the distance of mayor's and robing-rooms, and the prominence given to the education store are the only weak points in a beautifully-drawn design, which should, without question, receive a premium.

A departure from custom in works of this nature is seen in No. 13, where two staircases, each in straight flights, are proposed; it does not suggest the dignity which was asked for. No. 5 errs in this respect, for his main entrance and stairs are much too cramped.

No. 26 achieves dignity in a popular manner by placing a high-pitched roof and *flèche* above the council chamber, and leads up to the height in the composition with two circular turrets on the building line, each of which contains a public gallery staircase. The plan is practical and easy working, but the placing of the education offices upon the south boundary overlooking the future town hall, combined with excess of cost, has prejudiced the author's chances of success.

No. 38 is surprising in that a main angle entrance is contrived, from which a clever and unnecessary form of plan is evolved. The hall and stairs are too extensive and lead up to nothing. The dual use of the circular stairs to serve the galleries of the court and council chamber is adroit. The elevations are "fresh," leaning more to a domestic manner, to the exclusion of regulation competition features.

A large clock tower—the only one in the whole series—meets the eye in No. 10, and terminates an angle in the building front, whilst the council chamber, with main entrance, finishes the corresponding corner. It would have been better to have reserved the tower for the future town hall.

Throughout the competition a combination of three pediments—two of which are segmental—is largely introduced. Nos. 29, 28, and 8 are prominent in this respect. No. 4 has an excellent elevation, but the enormous expanse of lead flats quite prohibits serious consideration.

No. 9 has a closed-in building so far as the ground floor is concerned, with abundant top-lighted corridor. The main elevation, which is perhaps the shortest submitted, has a delightfull brick and stone treatment, with stone mullioned windows, steep roof, and ridge balustrade. No. 7 is overloaded with heavy pedimented projections where a greater use of an uninterrupted wall would have had more force; the planning is very good in all general respects, but there are six staircases leading to too many independent basements. No. 17 is the only competitor who provides large sheets of glass in the windows, and the design suffers in consequence.

ENGINEERING FEATURES OF THE LONDON COLISEUM.

QUITE apart from architectural considerations, the engineering features of the London Coliseum possesses much interest. Every effort has been made to secure the safety of the public by the adoption of fire-resisting construction for the walls, floors, and other main parts of the building. Nearly all the interior woodwork is of oak, and where pine and deal are used they have been rendered non-flammable by chemical treatment. Hydrants, alarm bells, and other fire appliances are liberally provided, and further assistance in case of any local outbreak of fire will be given by the complete telephone installation, which affords means of communication between all parts of the stage and the auditorium. Owing to the favourable situation of the building it has been possible to provide so many exit doors that the house can be cleared without difficulty in about three minutes. The stage is fitted with a fire-resisting curtain of asbestos and steel, and this curtain, 55 ft. in width, is raised and lowered by hydraulic machinery.

In the auditorium the Plenum system of heating and ventilation has been adopted, the installation being very similar to that applied by the architect at the Hippodrome, and on the stage heating is effected by direct radiation. The whole of the interior is lighted by incandescent electric lamps, but a few arc lamps are employed for special scenic and other effects.

A unique feature is to be found in the provision of lifts to convey the audience to the upper floors. Two electric lifts, each capable of accommodating eleven persons, communicate with the smoking lounge in the basement, the grand saloon, the foyers on the first and second floors, and the roof garden above. Although the extreme convenience of lift accommodation has been for many years demonstrated at the Albert Hall, it is a singular thing that no theatres in this country have previously been fitted with lifts, and we believe the same applies to Continental theatres. Another novel device, upon which the architect is to be congratulated, is the movable lounge by which visitors will be conveyed from the Royal entrance of the building to the Royal box. When the entrance doors have been thrown open the visitors will step directly into what appears to be a handsomely furnished apartment of the building, but really is a large car moving, upon a track formed in the floor, through the saloon and into a foyer containing the entrance to the Royal box. The car, remaining in position at this entrance, will serve as an ante-room during the performance. A door opposite to that through which the visitors enter from the street gives access to the Royal box, and the first-mentioned door communicates with the foyer, from which the public will be excluded when Royal visitors are present.

But the most remarkable engineering feature in the Coliseum is the revolving platform occupying a central position in the stage. The stage itself is one of the largest in this country, being 140 ft. wide by 85 ft. deep, and, being constructed entirely of steel, concrete, and teak, is practically non-combustible. The revolving platform consists of three concentric tables, the outer ring being 75 ft. in diameter. Each portion can be rotated in either direction by electric motors fixed in the basement at any speed up to 20 miles an hour. Immediately behind the revolving platform an electrically operated panorama can be placed, and it will readily be understood that an almost infinite variety of startling scenic effects may be obtained by the aid of these moving accessories. The operating switches for the revolving platform and the panorama are situated on a board at the back of the proscenium, so as to be under the immediate control of the stage manager. Above the stage a large grid and extensive flies are provided for raising, lowering, and manipulating the scenery, which can be rapidly moved in almost any direction by quick-running electrically-driven overhead carriers. The whole of the mechanical and electrical

equipment was installed under the direction of Mr. E. Wingfield Bowles as consulting engineer, the architects being Messrs. F. Matcham & Co., and the general contractors Messrs. Patman & Fotheringham.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at their Rooms at No. 9, Conduit-street, Regent-street, W., on Monday, Mr. J. Belcher, the President, in the chair.

Architecture and Building Acts.

The minutes of the last meeting having been taken as read, papers on "Architecture and Building Acts" were read by Mr. Lacy W. Ridge and Mr. J. S. Gibson.

The title of Mr. Ridge's paper was "Building By-laws, Specially in Rural Districts." He trusted, he said, to be enabled to lay before the meeting the broad outlines of a scheme fit to be submitted to the Government, and embodied with proper consideration and due technical drafting in a Bill for presentation to Parliament in the coming session. That the oppression and inconvenience of the existing by-laws was being constantly more and more widely felt, was particularly shown by the formation of the Building By-laws Reform Association. As regards Mr. Justice Grantham's case, it could be no small degree of annoyance that could cause a Judge of the High Court to come down from the Bench in order to resist this action of the local authority in his district. Architects might take up the judicial position in this matter. Though the trouble these by-laws gave them was great, the quarrel was not directly theirs. Their views were the views of experts.

Dealing with the main grounds of objections to the rural by-laws, Mr. Ridge said that primarily and chiefly they were an interference with the liberty of the subject, out of all proportion to the necessities of the case or the good done by them. Again, the whole scheme was founded on the fallacy that in every district there were a large number of fit persons able and willing to serve on local administrative bodies, with no axes to grind, with plenty of time on their hands, and capable *inter alia* of drawing up a code of workable building by-laws. Another objection to the system was its unnecessary clumsiness. This was illustrated more particularly by the requirement of the deposit of drawings, and that no building could be begun without the previous approval of the local authority. Things in themselves manifestly of no importance had to be complied with to save the face of the by-law. This hard-and-fast ruling and keeping to the strict letter of their regulations by bodies who could not trust themselves to administer with common-sense in practice, put the public at the mercy of the least intelligent member on the board. It was said that local bodies should insist on the letter of the law all round, or there would be all sorts of jobbery. Perhaps that might be so. That was just his point. To say that was a confession that one could not secure in these rural districts, by popular election, men to be trusted with any discretionary powers, and if they were not fit to exercise discretion, they were not fit to have authority at all over the buildings of their district. The present condition of things was stopping building in the country, and, above all, was cutting off the supply of labourers' cottages. It was now generally recognised that there was no efficient way out of the difficulty except by legislation. With respect to this it was important to realise the proper limits of legislation. It was not for the law as a fairy grandmother to lay down in such a case as this that which was desirable or comfortable or even economical or good building, but only that which the public safety demands should be enacted and enforced by officials appointed for the public and paid at the public expense.

A Rough Draft of By-laws.

Mr. Ridge proceeded to submit a rough draft of by-laws which he considered would suffice for the general regulation of building so far as the public interest was concerned in ordinary rural districts. These proposals dealt with—(A) Notice to the local authority of the kind of building intended to be erected; (B) Width of Road; (C) The provision of Open Space for purposes of light and ventilation; (D) Damp Layer and Course—being a shortened form of By-laws 3 and 4 of the Local Government's Model of 1903. The draft also contained regulations relating to sanitary arrangements; (E) Lobby to Closets; (F) Privy; (G) Soil-pipes and Wastes; (H) Disposal of Sewage.

Speaking of the disposal of sewage, Mr. Ridge asked: Have we not somewhat recklessly admitted the system of removing by water-carriage away from our houses matter which ought to have been returned to the land? Is not our wrong-doing constantly finding us out both in the smaller cases which we architects have to treat, and in the larger problems involved in the disposal of the sewage of our city?

One other subject (I) Party-walls, not included in the Model Rural By-laws of 1903, should, Mr. Ridge considered, most certainly be added, and be of universal application. The efficiency of the party-wall on small buildings for preventing the spread of fire was manifest. The Royal Institute had already submitted to the Local Government Board a carefully drawn clause on this subject, but it was neglected in the New Model in favour apparently of provisions as to the sizes of windows and heights of stories, which seemed to assume that the proposed buildings were to be carried out by lunatics. The Institute did not suggest that party-walls should be carried through the roof in small buildings, while in warehouses it suggested increased height, as in the London Building Act.

The by-laws proposed, Mr. Ridge considered, might be made universal in this country without oppression or inconvenience to the public. The system required no submission of drawings, no assent before building was to be given or withheld by any local authority, and the points were so little technical that such supervision as was needed could be given by any man who was fit to be appointed an inspector at all. When the local authority furnished sewers for the use of its district a new stage was reached. Plans showing the drains needed must be submitted, and the works to be executed agreed to as a condition precedent to having the use of the sewers. The author counselled the local authority and their officers to co-operate with architects in doing the best for the buildings under the special circumstances of each case, rather than regard their by-laws as the laws of the Medes and Persians, however useless and inapplicable they might be. The administration of by-laws with respect to the formation of roads and streets in the spirit of agreement rather than of command, would also do much to remove irritation.

Nothing, however, should be done to diminish the power of local authorities to deal with dangerous structures or places unfit for human habitation. On the other hand, it should be distinctly understood that these powers might be extended to deal with new buildings, should necessity arise.

The system proposed, well administered, would be far more useful to stop bad building than hard-and-fast by-laws. The local council and their inspector would soon discover the cases where intervention was necessary, and would leave the reputable builder, contractor, and architect alone.

Leaving London and the large towns out of consideration, the author considered his scheme sufficient for all practical purposes. In the most open country, and universally throughout England, space would be left for the roads, the cottages would not be huddled together, the laws of common cleanliness would be observed in sanitary matters, and material protection from the spread of fire would be afforded. The system suggested was simple, elastic, worked at small trouble to the local council, and with but few officials, and was applicable even in the smaller towns—in fact, until the stage was reached at which the community was justified in employing a really competent professional adviser.

Architectural Design and the Building Act.

Mr. Gibson, whose paper was entitled "Architectural Design and the London Building Act," said that the Building Act of 1894 was probably to the majority of London architects a series of regulations with which the artistic spirit was continually in conflict. The objects to be attained by a Building Act for such a city as London were twofold: first, in all matters relating to the construction of buildings it must contain such provisions as are necessary for the safety, health, and bodily well-being of the inhabitants, and in the arrangement and design of streets ample facilities for the carrying on of their daily work; while, secondly, its regulations should be such as would encourage the mental growth of the people by providing an environment likely to stimulate thought and invention.

Laying Out Streets, etc.

As regards the primary object—viz., the safety, health, and bodily well-being of the inhabitants, generally speaking this had already been attained by the London Building Act. As regards the second, the design and arrangement of streets to afford ample facilities for the carrying on of our daily work, he thought the Act was not wholly inadequate, but had not even touched the fringe of the subject. This was amply proved by the constitution of a Royal Commission on the Traffic of London Streets. In the *personnel* of that Commission it was rather amusing to find that all architects had been ignored; and, as far as he knew, no architect had appeared before it to express any views on the laying-out and design of London streets, yet if Sir Christopher Wren's scheme for laying-out the new streets of London after the Great Fire had been carried into effect, it is very probable there would have been no need for the present Royal Commission on Traffic, and Sir Christopher Wren was only an architect and surveyor.

When one realises the enormous annual loss to the community directly occasioned by the inadequate widths of the main streets in the central part of London, the lack of broad and direct lines of street communication east and west, north and south, on both banks of the river—when this is manifested day after day by the congested traffic in practically every main street within a radius of one mile of St. Paul's, group after group of cabs, motor cars, and 'buses intermixed with slow moving drays and carts stopped every quarter of a mile, the dislocation of streams of traffic occasioned by the loading and discharge of vans in Fleet-street, the Strand, Cheapside, Bond-street, and such-like thoroughfares, it must be patent to even the most indifferent that the time has come when, to put it on the lowest commercial grounds, the whole great question of the realignment of the main traffic arteries and their enlargement to the work to be done must be seriously taken in hand.

All new streets and the widening of those already existing should be part of one great scheme, conceived on large and generous lines, so that ultimately we should have a city of noble streets. As regards the laying-out of new areas on the outskirts of London, large estates are being continually cut up by the speculative builder into vast tracts of mean streets, lined with meretricious or vulgarly pretentious houses, disposed as he thinks best for himself, and with no regard to the surroundings, the main lines of traffic, or the fact that his area is an integral part of the whole town. The time has come when steps should be taken to compel the owners to lay out their land in the interests of the community as well as in the interests of the owner.

The utter failure of Shaftesbury-avenue, either as an adequate roadway or as an example of architectural street design, has evidently not been lost upon the authorities, for we find the London County Council setting out the Kingsway at 100 ft. wide instead of the 60 ft. of Shaftesbury-avenue, and this is a step in the right direction.

The author went on to compare the widths of important thoroughfares in London with those of Continental and American cities, and thought there would be general agreement with him that any amended Act should authorise the Council to provide for streets up to 100 ft. in width if the inadequacies of the present were to be obviated in the future.

Height of Buildings and Width of Streets.

The next point was the relation of the height of building to the width of street. In this connexion the author referred to an article in *The Builder*, of February 20 last, which, he said, dealt thoroughly with the point, and which he quoted at some length. The writer of the article expressed astonishment that in considering section 49, "the Institute Committee had made no protest against the absurd anomaly by which, according to the existing Act, a street 6 in. less than 50 ft. in width is restricted to buildings the same height as the width of the street, while a street 6 in. over 50 ft. in width may be lined with buildings 80 ft. high."

In buildings in the City of London the dominant factor governing the height was

usually the rights of lights of the opposite owners, and this had often determined the reasonableness of the heights of new buildings. When streets are increased beyond a width of 60 ft. the heights, he thought, might be also increased beyond the width of street without detriment to its architectural aspect. The author suggested the following as a schedule of maximum heights for streets within a radius of 1¼ miles of St. Paul's Cathedral :—

Width of Street.	Ratio of Height of Buildings to Width of Street.	Approximate Lowest Buildings.	Approximate Highest Buildings.
Feet.		Feet.	Feet.
40 to 60	1·000	40	60
60 to 80	1·125	67	90
80 to 100	1·250	100	125

For streets outside the 1¼ miles radius from St. Paul's Cathedral and within a 3 miles radius the heights should be equal to the widths of the streets, while outside the 3 miles radius the heights should be less than the widths of the streets, with a maximum height of ·75 of the width for streets of 100 ft. wide.

Air Spaces between Houses.

Another point of great importance is the provision of air spaces between the houses in the outer zones. The German regulation which stipulates for the outskirts of Berlin and other towns that there should be a space between the houses for aeration is a provision worthy of our serious consideration.

A further point is the provision of air-spaces to buildings, more particularly on corner sites in London, where by section 41, sub-section 4, the height of the building is limited to 30 ft. upon such part of the space at the rear of the building as the Council may think fit. It would tend to continuity of street frontage design if the restrictions as to heights of buildings on such rear spaces were abolished and percentages of areas of land to be covered substituted, and would render unnecessary the special applications to the Council which architects resort to only after they have tried every other expedient to obtain the effect they desire.

Minor Details of the Act.

Coming to the minor details of the Act which bear upon the design of buildings, the author dealt with the regulation governing the areas of openings and recesses in external walls. Section 54, he thought, was not properly drawn, even for a plain wall with openings and recesses in it, and as a regulation governing the whole subject of the relative areas of solids and voids in external walls of varied design and construction it was wholly inadequate.

The projection of cornices is a matter of very considerable importance in architectural design, and the arbitrary limitation to 2 ft. 6 in. met with wholesale disapproval. It should not be necessary, in streets of ample width, to set back the building line in order to obtain an adequate projection of cornice, as had practically been done under the present Act. Further, in streets of 50 ft. width and over, the projection of cornices, balconies, oriel, and bay windows should have fixed ratios to the width of street, and their erection permitted without having to make special application to the Council.

Some provision should also be made for overhanging eaves and verges, which do not strictly come under the heading of cornices, as there are great artistic possibilities in the treatment of wall-heads, gables, and pediments with overhanging eaves, and these would not interfere with the amenity of the streets in any greater degree than cornices of similar projection.

As regards the regulation governing shop-fronts, it would be a step in the direction of sober and logical design if it were made impossible to erect huge sheets of glass on ground and first floors. The public would welcome a return to more modestly-designed shop-fronts, and trade, he thought, would not suffer in consequence of the change.

The Institute had made some suggestions dealing with this matter whereby sufficient piers or other supports of granite, stone, brick, metal or other approved materials should be constructed from the level of the ground to the main wall of the superstructure above, and these piers should not at any time be covered with mirrors or otherwise concealed.

Mr. Gibson concluded by referring to three matters which he claimed to be of grave public importance :—

First, the lack of any provision in the present Act for the use of protected steel construction in buildings. Considering the advantages to be obtained by its adoption, the saving in floor space, the important bearing it had on the areas of support, the difference its proper use would make on the proportion of solids and voids in external wall design, it was greatly to be regretted that its adoption as a building material was not foreseen and provided for. Buildings were constructionally erected in this material, and then the external and other walls built around the steel in the same huge masses of brick and stonework as were necessary for buildings erected of the latter materials only. Practically the whole advantages of steel construction were nullified, and enormous masses of materials and labour absolutely wasted.

Secondly, he protested against the exemption of certain buildings of railway, canal, and dock companies from the operation of clauses 6 and 7 regulating matters of construction and design. One could only think with indignation of such atrocious structures as Broad-street, London-bridge, Ludgate-hill, and Victoria stations, to mention a few examples of the ill-doing of these private companies. It was nothing less than a public scandal that a great city like London should be powerless to insist on the instant removal of such structures.

The third point of public importance was the great desirability of all District Surveyors being practising architects. Nothing could be more inimical to the interests of the public, to the growth of architecture, to the beautifying of our streets, than to have as interpreters and administrators of a complex Building Act persons who, although highly skilled in technical knowledge and masters of routine, were inexperienced in the erection of buildings. In the interpretation of the various regulations dealing with complex modern buildings it was essential to have men who were experienced in modern architectural practice, men who knew the difficulties that were constantly arising, who were intimately conversant with the schemes of architects as judged by their designs. He commended to the consideration of all District Surveyors the second section of the Building Laws of New York—viz., "This ordinance is hereby declared to be remedial, and is to be construed liberally, to secure the beneficial interests and purposes thereof."

The author hoped that the attention of the City Corporation and the London County Council would be given to all the matters raised by the reading of the papers that evening, and that they would use every means in their power to further the development of London on lines that would give them a noble city.

Mr. Reed (Hon. Secretary of the By-Laws Reform Association) in proposing a vote of thanks to the readers of the papers, said they both dealt with subjects of immediate interest, but he could not help, perhaps maliciously, pointing out that they were somewhat mutually destructive. Mr. Ridge advocated legislation somewhat in detail as a remedy, while Mr. Gibson, who was dealing with the London Building Act, pointed out how rigidly that Act had been dealt with. That Act, if he might say so, was nothing but a glorification of by-laws put into an Act of Parliament. He hoped Mr. Ridge would forgive him if he differed from him in that part of his paper. He was glad to testify from his immediate experience of rural by-laws, and from past experience in connexion with the London Building Act of 1894, to the enormous assistance that gentlemen of his profession derived from being brought into contact in these matters with members of the architectural profession. He was one of those who felt that they should be able, outside the walls of Parliament, to meet and determine amongst themselves those things which were simply matters of detail, for it was impossible on the floor of the House or in Committee Rooms to deal adequately with questions of the construction of buildings, to use that as an example. If they were to get assistance in the matter, especially of rural by-laws, he would urge upon that Institute the desirability of avoiding anything like detailed legislation. That legislation was needed he entirely agreed, but what was wanted was legislation which would enable them as architects to have a free hand, so that they would be able, so long as they were doing what they considered was best for their clients, and their clients were doing what they considered was right for their tenants and the public, to build such buildings as their experience had taught them were good and necessary for the purposes for which they were intended to be used. It might be Utopian, perhaps, to think they had only to say that a building should be good for the purposes for which it was intended. Of course, they had to meet with by-laws administered by local authorities as they found them, and not as they would have them, and his view was that it would be better to work in the direction of getting exemptions from by-laws and not in the direction of re-enacting by-laws which would get them into possible trouble. His view was that a code of by-laws might be framed which might be administered with the existing machinery without unduly hampering those who had to provide either large houses for the well-to-do or small cottages for the poor. This last point had been brought into a great deal of prominence lately, but he would not refer to any specific case. It had become a burning question how to make it possible to provide adequate accommodation within the means of those gentlemen whose incomes were derived from land, and it seemed to him that if they provided sufficient space and sufficiently sound cottages, beyond that nothing should be required. The Building By-Laws Reform Association had laid before Mr. Long their Bill, the main features of which he would give. The first point urged in the Bill was that houses, whether small or large, in places other than those covered by special building Acts, such as London and other large cities, should, subject to certain space being provided around them, be freed from all structural building by-laws. The second point was that the Local Government Board, where it finds the laws sanctioned by it are oppressive and unsuitable to the district in which they were being applied, should have power to substitute other by-laws. It seemed to him that these two things would enable the central authority and the local authority adequately to protect public interests in all directions. Probably the whole question was summed up in two small things. If they were really anxious to get immediate relief it could only be done by bringing forward a Bill which would offer the fewest points for opposition, because in the present state of legislature in the country, unless the Government would itself bring in a Bill, there was little chance of its being carried unless it contained the minimum of points for consideration.

Mr. Ridge said the last speaker had not quite followed out his proposition with regard to the Act of Parliament. His point was that the Act of Parliament should be passed solely and simply to enable the Local Government Board to take away all the powers which they had so foolishly granted to these urban bodies, and to substitute for them such simple by-laws as it should seem to them right to enact. That was his proposition, which could not be shorter.

Mr. G. Hubbard, in seconding the resolution of thanks, said they had heard two extremely interesting lectures. There was one point in Mr. Ridge's remarks which was not quite clear to him. Mr. Ridge spoke of seven new by-laws he was suggesting for the urban district councils. One was that the area at the back of the building should be of the full width of the buildings.

Mr. Ridge said that was not quite so. His suggestion was that the space area of every cottage and house should be equal to its own area on the ground floor level. His point was that they might put it where they liked, and in that way they would get rid of the question as to what was rear and what was front.

Mr. Hubbard said that did away with his point, and was much better than the present London Building Act, which required an area of the full width of the building at the rear. He did not know whether it had ever occurred to them that that by-law made the building of terrace houses round a crescent utterly impossible. An architect he happened to know submitted some plans to the London County Council for some terrace houses round a crescent, and the London County Council, in their wisdom, refused to pass those plans because they said they were not in accordance with the London Building Act, and their argument was that it was impossible to build terrace houses on a crescent because of necessity the area at the back must be less in width than the width in front. The London County Council squared the matter. They said they wanted some

land on the other side of the road, and that if the architect's client would give up that land to them they would be quite prepared to pass the plans. Of course, it was not a proper equal exchange, but still the matter was got over in that way. Another absurdity of the matter of the width of roads must be apparent to them all. The London County Council had done it themselves, but other people could not do it without their consent, and that was to construct a crescent road; because the Act required that all new roads must connect directly between existing roads, and the County Council had resolved that a crescent was not a direct road, and, therefore, under their own regulation it was impossible to build a crescent road. The absurdity of the urban district councils by-laws was very much brought home to him some little time ago. He had received instructions to build a house for a client, and he had to set the building line 40 ft. from the road. After the house was complete his client wished him to add a billiard-room, and the only possible way of adding the billiard-room was by projecting 2 ft. 6 in. in front of the building line. He sent his plans to the urban district council, and gave notice that he would begin building. It was not necessary to obtain their consent to do that, for the Act only required that they should submit plans to them. He submitted his plans, and began his building, and their surveyor came down and viewed the trenches and approved of them, and saw the concrete, and so on; and he was putting on the roof of his billiard-room when he received a communication from the urban district council to say that the plans had not been passed. He inquired as to what was the matter, and was told that his billiard-room was 2 ft. 6 in. in front of the building line. He told them that the surveyor had passed it, and asked what they wanted him to do, and they replied, "set back the billiard-room." He told them it was impossible to do that, and the next thing was he was served with an injunction from the council, and he went before the magistrates. The magistrates said they were very sorry for him, and that the council had, in a sense, condoned the offence as their surveyor had passed the work from time to time, but they could not be blind to the fact that it was an infringement of the Public Health Act, and they fined him 20*l*. Well, he thought he had got off very lightly, and he again went on with his work. To his utter surprise he was again informed by the urban district council that he was not to proceed, and that they were going to bring another action against him. They said "that billiard-room is still in front of the building line." He replied that he had paid 20*l*.; and they said "that does not settle the matter; you paid 20*l*., but that was to condone the offence up to the time of the action, but the evil is still being continued." They brought another action, and he took it to the High Courts and judgment was given against him, and he had to pull down the billiard-room. When they came to consider that this was a large house standing in its own ample grounds, as the agent would describe it, and that there was not a house within a quarter of a mile on one side, and the occupants of the houses on the other side could not see the billiard-room at all, they would see the hardship. It was an absurdity that he should have been compelled to pull down a room which projected 2 ft. 6 in. from the building line where the house stood 40 ft. from the road. On the matter of the building line, there was something absolutely absurd in the working of the Act. Clause 3 of the Public Health Act said: "It shall be unlawful in any urban district without the written consent of the urban authority to erect or bring forward any building or any part of such building beyond the front main wall of the house or building on either side thereof." That meant that without written consent they could not bring forward any portion of their building in front of the main front wall of an adjoining building. Now, they could imagine a road with plots of land, and the man who put up the first building determined the building line. Perhaps the man next door wanted a large bay window, and as that must not be set beyond the main wall of the first building, the house has to be set back, and so a new building line was established. The next man might like a large front garden, and if he built right at the back of the land, under this Act no one could go in front of him, and the remainder of the sites would be absolutely worthless.

Mr. W. Woodward thought the papers were so important that the discussion on them should be adjourned to the next business meeting.

The Chairman said there was a business meeting on January 9, at which the discussion could be continued.

A member said that at the next business meeting they would have to deal with Bills before Parliament, and he would suggest that the discussion on Mr. Ridge's paper should not be mixed up with the discussion on the London Building Act.

Mr. Ridge said that he felt it would be a good thing if they could separate the two subjects, for they were totally different.

The discussion was then continued on Mr. Ridge's paper.

Mr. Woodward said that one of the great features of Mr. Ridge's paper was the very proper attack upon officialism. The whole bane of architects carrying out architectural work was the interference of gentlemen more or less acquainted with the subjects with which they had to deal. They as architects knew of the narrow-minded interference which did not give any benefit to the public, but only led to loss of temper on the part of the architects and loss of money on the part of their clients. Take, for instance, the enormous number of drawings which they had to submit to the various local bodies. These authorities were not satisfied with one set of drawings, and in some cases a third copy had to be provided. They were inundated with paper and red tape, and the sooner they got rid of it the better. It had been asked why, with regard to the London County Council requirements for drawings, the architect should object as he did not have to pay for them. He was certain, however, that every architect would agree that one of the great difficulties they had to deal with was having to ask their clients to pay for the enormous number of unnecessary drawings. With regard to rural by-laws, they must all sympathise with Mr. Justice Grantham, for it was an instance where the whole trouble had been created by men not sufficiently informed upon the subject brought before them. It was impossible for the gentlemen composing local bodies to deal adequately with the matters brought before them, and if an architect or surveyor were employed he would be able to go through the drawings and initial them, and that was all that was necessary. What they had to deal with now, however, were delays and constant revision of drawings for no earthly good. In the case of drains, for instance, they had to submit drawings and plans of sections of each floor simply to show a water-closet on the first or second floor, and this was an absolutely unnecessary expenditure of time and money. If they only imported common sense into all these questions they would find that the evils which had been referred to would be disposed of. He could not agree with the Secretary of the By-Laws Reform Association that legislation should not be provided, and he thought that the by-laws suggested by Mr. Ridge were just the sort of outline by-laws which everybody should conform to. He agreed with Mr. Ridge that the area of the vacant land should be equal to the land covered with bricks and mortar wherever it might be. That would get rid of a great difficulty, and would ensure the necessary health space. As to being able to start a building before the drawings were approved, he did not see why a man should wait until it suited the convenience of local bodies before he could make a start. He thought that a man should be able to submit his drawings and then make a start, and if the surveyor saw that he was doing anything wrong he should call the attention of the architect to it, and not allow the man to go on with his building when he knew that something was being done in contravention of the by-laws. He believed that Mr. Ridge's paper would do a great deal of good, and if he could succeed in doing away with officialism and in reducing the consumption of red tape, and finally abolish the central authority in Whitehall, he would be doing a good thing.

Mr. Maurice B. Adams said that with regard to the question of drawings they must remember that a great many buildings were not carried out by architects at all, and this was important. They had to submit to a certain amount of red tapeism, and he felt that they ought to willingly submit to a certain amount and to go as far as Mr. Ridge suggested. One question which Mr. Ridge alluded to he spoke somewhat feelingly about, and this was with reference to the width of roads. So far as he could understand the law at present the district council had no power to define the width of a road other than the minimum width of it. Very often great hardship arose where the road was made through a property adjoining other property. Perhaps a man had a plot of land and another man bought land at the back, and to develop this land he made a road with a width of 40 ft., which is the minimum width. If the road was made of this width right through, that might leave a strip of 5 ft. at the side of the first plot, and so the man making the road made it 45 ft. at this point, and did away with his strip, and so did not have to pay for the making up of the road. The local authority said they had no power, and that the person whose land was made to abut on the road would have to pay for the making up of the road. He happened to be the possessor of a piece of land where that had arisen, and his tenant told him he should expect when his term expired to pay less rent, while he (the speaker) would have to pay for the making up of the road he did not want. That was a little instance of where it was necessary to fortify and assist the local council in order that they might protect the interests of the public and of individuals against that which was manifestly unfair. He did not know whether Mr. Ridge proposed that councils should have power to determine the width of roads, but so far as he understood at the present moment they had no such power.

Mr. J. H. Ball remarked that the debate had been rather disappointing, and he would like to ask whether the adjourned debate would be upon the regulations of rural district councils, or would it be upon any proposed by-laws.

The Chairman said it would be a continuation of their present debate, and they would take both. At times they all felt the oppression of rural by-laws, and they had great sympathy with those who had such experience. The chief point which both the readers of the papers had impressed upon them was the increase of officialism. What they wanted to have were men who could be responsible and who would not shirk responsibility; who would be men who had great experience and who were probably in active practice and who were able to determine each case on its merits. Mr. Ridge had suggested by-laws which concerned the community at large. Those were the points on which they required legislation, and then came the common sense of the official who would regulate their details. What was really required was a responsible individual to take up these things and deal with them separately.

The debate then stood adjourned till January 9.

STREET ARCHITECTURE.

A MEETING of the Applied Art Section of the Society of Arts was held on Tuesday evening, at the Society's premises in John-street, Adelphi, W.C., Dr. Longstaff, L.C.C., presiding, when Mr. T. G. Jackson, R.A., read a paper on "Street Architecture."

Ten years ago, he said, a paper was read in that room on the same subject by Mr. Beresford Pite, and he remembered saying that the old Strand had always struck him as being one of the most picturesque streets in Europe. It was too soon to pass a final verdict on the architectural result, but the old Strand which had delighted their eyes for so long had gone for ever, and it remained to be seen whether its successor would charm equally though in a different way. It was right, when sweeping changes, like those that were transforming this part of London, were being effected, to seek for and examine the principles that ought to govern street architecture. But these principles should not be kept for these occasions alone, and it was important that the true principles of street architecture, if they could be discovered, should be applied to works on a small scale as well as to those of grand dimensions. There was nothing, for instance, but good principles to prevent any freeholder from building or rebuilding his house in some incongruous fashion which would spoil a whole street. One principle which ought to govern street architecture was surely that consideration should be had for neighbouring buildings; because street architecture was social architecture, and it ought to conform to those rules of convention by which men in society were governed. Buildings in a town street could not indulge in the freedom that was

permissible to a house in the country any more than the owner could live in town with the same easy disregard of appearances that he enjoyed when he was away. Architecture might be guilty of social offences quite as much as the architect. Violent interruptions, startling contrasts of demeanour, disregard of the conventions of society, efforts to shout down and overpower his company, which would put a man outside the pale in the civilised world, find a very close analogy in the pretentious buildings that one often finds thrust into the streets and squares of London without the least regard for the style of the work they interrupt or the scale of the buildings they overshadow. Could anyone look without irritation at the north side of Cavendish-square, where the fine symmetrically-placed houses in the severe classic of 1770 were crushed by an enormous pile of nondescript architecture on one side of them; or look with satisfaction at the strange sky-scraping structure that mars the wholesome brick architecture of Hanover-square; or view without dismay the appalling intrusions that were breaking up and destroying the design of Regent-street, the one fine and consistent piece of street architecture in London? These offences were more flagrant and mischievous in proportion to the architectural value of the neighbouring buildings that suffered by them. An example was to be seen at Great Malvern, where a huge pile of building had been allowed to grow up actually touching the west end of the Priory Church, and overshadowing it. There was another at Bath, where a monster hotel overtops the east end of the abbey close by. A familiar instance is to be found at Milan, where the west front of the Duomo, despite its enormous size, is crushed into comparative insignificance by the new buildings, and the prodigious front of the Galleria on the north side of the Piazza. The first principle that he would lay down for town architecture was that there should be a consistency, a regard for the surroundings, an absence of vulgar rivalry in display, corresponding to that consideration for others which was the essence of good manners among individual men and women; that ordinary houses should subordinate themselves to buildings which, from their public uses or their architectural importance might fairly claim precedence; that, in fact, there should be a "comity" of conduct in architecture as well as in society; any violation of which should be condemned by public opinion as in bad taste, inartistic, and intolerable. Another consideration that arose out of this, especially when there was a question of cutting through old towns and forming new thoroughfares, was that when the alterations approach or touch beautiful buildings whether old or new, they should be designed so as to fit them, and bring out their beauties and enhance their architectural effect. This was a principle that had been much more attended to abroad than with us. The Louvre must have gained enormously by the construction of the Rue de Rivoli, and the old Tuileries by the formation of the gardens and the Place de la Concorde. With us, hitherto, this principle seemed rarely if ever to have been thought of, new streets and roads having been planned solely for convenience, easy gradients, and economy, with very little thought of artistic effect. What splendid opportunities had been missed, for instance, when the alterations were made at Hyde-park-corner, which, though they had facilitated traffic to some extent, had destroyed the little there was of orderly arrangement, when Decimus Burton's arch and screen stood in some sort of relation to one another. A still worse failure was that at the site of the old circus where Regent-street joins Piccadilly. The fault did not always rest with those who lay out thoroughfares in London. Considerations of economy had to receive attention, but they should not always be allowed to prevail over every other. When unusual opportunities occur of making a beautiful street, as for instance in the alterations of the Strand now in progress, it would be unworthy of a great capital to treat the matter solely or even mainly from the commercial point of view. It must not be forgotten that the present chance of making a fine thing would not occur again, and that a mistake made now from a too parsimonious motive would lay up a store of disgust and irritation in the future, and a bitter regret for a wasted opportunity. This however was what we are threatened with in the case of the Strand between Wellington-street and the Law Courts. As far eastward as the end of St. Mary's Church there seemed nothing to complain of in the frontage line adopted. The debatable line was that east of St. Mary's, running from it to St. Clement's, about which there had been a great deal of discussion, and would probably be more. The new frontage lines as approved by the County Council signally failed to fit the lines of the churches of St. Mary and St. Clement, and to bring out and enhance the architectural merits of those structures. The plan approved would have an accidental, haphazard character, with none of the dignity given by regularity, and it was one in which the very elements of true architectural treatment were not so much neglected as deliberately rejected. In no other capital in Europe would the economical question have been allowed to prevent so grand and important a scheme from being carried out in the best way possible. On such an occasion the Council could not fairly be accused of extravagance if it sacrificed something to those æsthetic considerations which had been brushed aside as if they carried their own condemnation with them. Another principle to be observed in altering or improving an old town should be that the general lines of the main streets ought to be respected whenever possible, and the general conformation of the plan as little altered as was consistent with public convenience. Considerations of convenience on the one hand and of beauty or sentiment on the other were seldom wholly irreconcilable. Streets were not, or should not be, mere mechanical contrivances for getting from point to point as speedily as possible. They had never been so regarded at any age but our own. One might almost say they were not so regarded now in any country but this. They should be beautiful and interesting, and so disposed as to show off their buildings to advantage and to preserve faithfully their historic traditions. One very awkward result would be avoided if the lines of old thoroughfares were taken in laying out new ones. Everybody must have noticed the sharp triangles to which corner houses come in most of the new streets that have been driven through crowded districts of London. They were caused by the fact that the general trend of the old streets lay obliquely to the line chosen for the new ones. In the new Kingsway towards the Holborn end the line was fairly square with the streets it passed through, but as it came south the street bears off obliquely, and this unsightly result would have the usual bad effect, unless the adjoining streets were altered also for some way outwards. But bad as these sharp-ended sites were for architectural effect, and inconvenient as they must be for internal plan, they were not so bad as the rounded ends and corners which had been the fashion in new streets. Rounded angles were seldom agreeable in architecture, and were best avoided. They deprived one of the firm outline and positive drawing which the eye demands in builder's work, and substituted for it a certain weak indefiniteness which was destructive of true form, and confused the elements of proportion. Whether in large or small buildings this rounding of the mass was equally injurious. Small buildings, perhaps, needed sharp square forms and positive outlines even more than large ones, and yet nothing could be less satisfactory to the eye than these rounded fronts on a great scale, as, for instance, the Grand Hotel at the corner of Trafalgar-square. In the case of a street entirely new from end to end, like Kingsway, many difficulties were absent. This was particularly so in the matter of scale. The buildings that lined Kingsway might be as large as they pleased. But in the case of the Strand this was not so. The proper scale was given there by the two churches and by Somerset House, and the new buildings must conform to that scale, if they were not to spoil the picture. Unfortunately this was not likely to be a consideration with either the London County Council or the lessees of the new sites, if one might judge by the beginning that had been made. Perhaps it was not too late to induce the Council to fix a height for the Strand fronts properly proportioned to the scale of the old buildings which gave the Strand its peculiar charm. We did not want an "imposing effect," as the report of the Improvement Committee called it, on the north side of the Strand. Let the "imposing effects" be reserved for Aldwych and Kingsway; but even there it was to be hoped that megalomania would not be allowed to run roit. In hot countries, where the sun was an enemy to be shut out, narrow streets between lofty houses were reasonable. But in England the sun was a visitor who never or rarely outstayed his welcome, and we wanted as much of him in our streets as we could get. The houses of Regent-street and Oxford-street and of the untouched parts of the Strand were of the ideal height for our dim murky London streets. As to the best way of laying out street architecture on a general scheme, should it be treated as one whole, a single design to which every builder of a part must conform, or was the building line to be the only rule, and was all style, scale, and architectural treatment to be left to individual taste? Was the architecture of the street to be individual or collective, accidental or regular? There was much to be said for either alternative; but the unrestrained genius of the commercial architecture of to-day was to be regarded with misgiving. The result would probably be a competition in which every house would try to outshine its neighbours by cramming on more ornament, overpowering them in splendour and overtopping them in height. Better far than this the monotony of Gower-street or the unloveliness of Wimpole-street. The tide of self-advertisement was rising. It had laid nine-tenths of our architecture at its feet. Art was supposed to consist in ornament, and ornament was valued according to its quantity, not its quality. Perhaps the crucial difficulty of street architecture was the shop-window. In these days of display, it was thought necessary to abolish the front wall of the ground floor and to substitute huge sheets of plate-glass. The architect must reckon with these shop fronts, but how were they to be treated architecturally so as to be tolerable, or actually an element of beauty in a façade? To bring the new construction, consisting of two steel stanchions and a beam across, within the domain of art, it was only necessary that it should be visible. There was no reason why the stanchions and bressummers should not be treated architecturally, instead of, as now, being concealed, so that the building appeared to be supported on the edge of a plate-glass shop front. Until we made up our minds that, if we accepted the new mode of construction by iron, we must break definitely with the traditions of brick and stone there would be no hope for us. Never was there so much talk about the advancement of art. Art schools covered the country and scholarships were showered on the students; but we should surely stultify ourselves if, when the time came for putting our pretended interest in art to the test, we chose the worse way of doing an important work instead of the better, from purely utilitarian motives.

The Chairman, in opening the discussion, said that the great problem was to impress on our municipal bodies the importance of those æsthetic considerations which were now so much despised. Unfortunately, æsthetic perceptions were not often found in combination with the sort of character which would lead a man to toil over municipal work day after day. As a rule, our municipal bodies did not represent the average taste of the nation. Not nearly enough attention was given to architecture as an art in this country. Architecture might be taught in connexion with history as well as with art, and then better canons of taste might be hoped for in the public. Our ædiles in the present day did not know what was good and what was bad. The most hopeless thing in modern town architecture was the height of the buildings; but he feared there was no hope of imposing greater restrictions in this direction.

Sir J. Wolfe Barry said that at present the streets of London were inadequate for traffic which they had to accommodate, and there would probably be a great effort in the future to make new and wider streets, to prevent the loss due to congestion of traffic which now fell principally on the wage-earning classes. It was most desirable that these future street improvements should be considered from the artistic point of view as well as from the utilitarian; but of course utilitarian considerations must come first. The architect of the future must discard a great deal of what he had been taught of Roman, Greek, and Gothic architecture, which was not suitable for modern commercial life. He must study steel and iron construction and see how it could be made artistic. There was no reason why steel and iron should not produce a beautiful and harmonious whole. It would be difficult to improve, for instance, on Southwark-bridge as an iron structure, and the great arches of Blackfriars-bridge were not unworthy of admiration. If the big shop-window was a necessity of modern street architecture, the trabeated form of construction was the only one

which could adjust itself to the conditions. Until architects set themselves free from traditions which were not applicable to modern requirements, we should continue to be confronted with bastard styles of construction, both ludicrous and unsatisfying.

Mr. Reginald Blomfield said that architects must look to civil engineers to teach them how to deal with iron and steel. In this country we had not yet a sufficiently high standard of taste to warrant the setting up of an artistic directory of control in architecture. But it was the absence of any definite principle in the designing of our streets that had led to some of the horrible fiascoes of the London County Council.

Mr. T. Blashill pointed out that taste changed radically in twenty years; and he thought that individualism ought to prevail over collectivism. If the public wished to have elevations to suit their taste, they would have to pay for them. When land was let by auction there was a limit to the restrictions which could be placed on designs. But if it were desired to have control over designs, why not let the land for a fixed sum, subject to the approval of the design, which thus would be seen before the bargain was completed?

Mr. Halsey Ricardo exhibited a design for a model street fulfilling modern requirements.

Mr. Mark Judge urged that there must be something wrong when land in such a position as that fronting on the Strand remained uncovered for months together.

The proceedings terminated with a vote of thanks to Mr. Jackson for his paper.

THE BRITISH ASSOCIATION OF WATER-WORKS ENGINEERS.

THE annual winter meeting of the British Association of Waterworks Engineers was held in the Lecture Theatre of the Geological Society, Burlington House, London, on Saturday, December 10. Mr. F. J. Bancroft (Hull), President, was in the chair, and among those present were Messrs. P. H. Palmer (Hastings), Dr. Kemna (Antwerp), W. Whitaker (London), C. E. Jones (Leyton), J. Hutton (Scarborough), C. Sainty (Windsor), T. N. Ritson, H. E. Stilgoe, W. Matthews (Southampton), W. Watts, Percy Griffiths, Secretary, and others.

The President read the report of the scrutineers, to the effect that Mr. P. H. Palmer (of Hastings) had been elected President, Messrs. W. Millhouse (Scarborough) and C. Sainty (Windsor), Vice-Presidents; and Messrs. C. Greenslade, W. Matthews, H. Ashton Hill, W. H. Humphreys, C. E. Jones, H. E. Stilgoe, J. S. Pickering, T. Bower, J. J. Lackland, and C. C. Smith, members of the Council for the ensuing year.

Mr. Palmer thanked the members for his election as President, and promised them a hearty welcome on the occasion of their visit to Hastings.

The President, on behalf of the members who attended the summer meeting of the Association in Belgium, presented Dr. Kemna with a silver tea and coffee service, suitably inscribed, in recognition of their appreciation of his services. He said that Dr. Kemna's urbanity, his stock of technical knowledge, and the heartiness with which his brother managers came to his assistance—all these things combined to make the visit an unqualified success.

Dr. Kemna, in acknowledgment, said a good deal of the appreciation of the members was due to the fact that they were favoured with good weather, and to his countrymen and friends, the waterworks engineers of Brussels, having done all they could to show how pleased they were to receive their visitors.

Warrington Waterworks Extension, Appleton.

A paper by Mr. George Mitchell on the "Appleton Extensions of the Warrington Waterworks" was read by the Secretary. He said the Appleton Waterworks were designed by the late Mr. J. F. L. Bateman, and were carried out in 1846, being extended in 1859 and 1901. Previous to the execution of the 1901 extensions (which were carried out under the Warrington Corporation Act, 1899), the works consisted of a storage reservoir of a capacity of 62 million gallons; two filters, having a sand area of 915 square yards; and a pure water tank of a capacity of 300,000 gallons. The pure water tank was originally covered by flags laid on girders, supported by cast-iron columns, but as the roof had been allowed to get into a bad state of repair it was entirely removed about eight years ago. The effect, however, was the production of large quantities of green growth in the water, in consequence of which it was resolved to construct a new covered pure-water tank, and, the filtering area being inadequate at certain seasons of the year, the old tank was converted into two filters.

The old filters were rather shallow, so a slight excavation was necessary before the re-construction could be commenced. A thin layer of fine concrete was then spread on the bottom and carefully smoothed over. The bitumen sheeting was laid on this, and covered with a layer of fine concrete 5 in. thick, with a finishing coat of cement rendering. The sheeting on the slopes was protected by means of blue-pressed Staffordshire brick-on-edge paving, finished off with stone coping. Considerable difficulty was experienced in laying the bitumen sheeting owing to the pressure of the ground water during wet weather; but, holes being made good and the paving completed after the brickwork had set, no further trouble was experienced.

The filtering material consists of 2 ft. of sand, supported by gravel of an average depth of 10 in., supported on a false bottom of perforated tiles laid on lines of brindle bricks. This form of under-drainage has been in use on other works for at least thirty years.

The inlets to the filters are provided with Glenfield and Kennedy's non-concussive ball valves (fitted to act also as stop valves) to keep the water at a constant level, and the main drains discharge into wells containing Glenfield-Jones automatic regulators. The water is used exclusively for trade purposes, and the filters are merely required for the clarification of the water. Had the removal of bacteria been essential, the author would have increased the depth of sand to 30 in., and used finer sand for the top portion.

The capacity of the pure-water tank or service reservoir at the Appleton Works is 683,000 gallons. It is circular in plan, and constructed almost entirely of Portland cement concrete. As the trial pits disclosed the presence of a fairly good clay all over the site, the author at first proposed to use puddle-clay work, but after looking further into the matter this idea was abandoned, and it was determined to use Callender's bitumen sheeting as the water-tight medium. The chief objection to the use of this class of material being the high cost of the necessary protective covering (which sometimes exceeds 10s. per square yard), it occurred to the author that in such a shallow reservoir it might be possible to place the sheeting at the back of the wall instead of at the front, by which means, the soil being clay without any stones, all protective covering would be dispensed with. After consultation with Messrs. Callender this method was decided on. On the concrete foundation for the walls bitumen sheeting was laid of a width sufficient to leave a considerable lap at both sides, and, the walls having been built, the sheeting was continued up the back, being tied into the walls by small bolts with 6-in. cast-iron washers, placed about 30 in. centres horizontally and vertically.

With regard to the roofing of reservoirs, the author is of opinion that where thoroughly good work can be secured, cast-iron pillars form the ideal support, and these would have been adopted in this case had it not been for the difficulty experienced at the High Warren reservoir in securing the delivery of such in reasonable time.

In the Appleton Reservoir, therefore, the roof was supported on blue-brick pillars, 1½ bricks square. These were very long in proportion to their sectional area, and the author found great difficulty in arriving at their safe working strength, data on this point being very scarce. The pillars were recommended immediately the excavation was got out, in order that they might be thoroughly set before being loaded, and the greatest care was taken in selecting the materials and in levelling and plumbing the work at very frequent intervals. In fact, the labour charges of this work amounted to at least six times as much as in ordinary brickwork. The roofing consisted of 4 to 1 concrete, 4½ in. thick, with a tension bond of No. 8 expanded steel, carried on rolled steel joists at 7 ft. 8 in. centres. Care was taken to ensure the expanded steel being completely surrounded with cement mortar. The steel joists were not cased with concrete, but were given five coats of "siderosthen" paint, having first been thoroughly brushed with wire brushes; a mechanical water-level indicator is fixed on the reservoir. The discharge takes place through an ordinary bell-mouthed pipe, with its invert 4 in. above the bottom. The cost of the reservoir was at the rate of about 3,400*l.* per million gallons capacity, which the author believes is fairly low considering the small size of the reservoir. The following details may also be of interest: The 6 to 1 concrete in walls cost 17s. per cube yard; 4 to 1 concrete in roof cost 23s. per cube yard; rolled-steel joists cost 9s. per cwt. fixed.

The Water Supply of Penzance.

A paper by Mr. Frank Latham, M.Inst.C.E., Borough Engineer and Surveyor, Penzance, on the water supply of Penzance and the hydrogeology of Cornwall, was also read by the Secretary. He said that until recent years the town of Penzance was entirely supplied with moorland water by gravitation from two open reservoirs of 12 million gallons total joint capacity. A few years ago, owing to improved sanitation and increased population, this storage became insufficient to meet the full requirements of a constant supply, and it was found necessary to supplement the works accordingly. During the winter months the reservoirs are well replenished with water, the quantity collected from the moorlands and conveyed into them being abundant, and more than 50 per cent. in excess of the consumption so long as the average winter rainfall lasts; but as soon as this decreased, that is from the end of May, the reserve is soon drawn upon.

In order to augment the supply during the four or five months of drought, pumping from a new well has been resorted to for the past three years. Pumping is limited to the periods when the supply of moorland water is insufficient, so that the cost of pumping is not continuous throughout the year. The water obtained from the well is much appreciated during the summer months on account of its low temperature.

During the first year of the new well being used the water thus obtained was mixed with the moorland water in the uncovered reservoirs, which by the middle of the summer contained more well water than moorland water. This well water, being now exposed to the action of the sun, favoured an abundant growth of objectionable green weeds of considerable length, and during the summer of 1902 the amount far exceeded anything of the same character seen in previous years, when mainly moorland water had been enclosed. These weeds gave a flat taste to the water, decomposed rapidly, and clogged the filters. When the quantity of well water was but small compared with the quantity of moorland water, the water stored in the reservoirs was found to remain pure and free from large growths of weeds for a much longer period. As regards chemical purity, the well water is far better for drinking and domestic purposes than the moorland water, but whether owing to its hardness or the presence of carbonic acid, or some other cause, the growth of vegetation develops to a remarkable degree directly it is exposed to sunshine.

A scheme has now been carried out which answers the twofold purpose of preventing the growth of weeds and giving additional water pressure to the higher portion of the town. For this purpose the author designed and built a covered service reservoir at a higher altitude than the existing reservoirs, and the water from the well is pumped into this, and not allowed to mix with the moorland water in the larger open reservoirs. The mains in the town have now been divided into two systems or districts, each having a separate supply main, one connected to the open reservoirs containing the moorland water, and the other connected directly to the high-level covered service reservoir containing the well water, which supplies the higher part of the town at a better pressure than was previously the case.

Seeing that the pumping operations are suspended during the winter months, some arrangement was necessary for continuing the higher pressure requisite for the upper district during that period. This was effected by close-piping the stream which conveys the moorland water to the reservoirs, the pipes, which were of cast-iron, being laid far enough up the stream to obtain a sufficient head for feeding the high-level reservoir. The object of storing well water in closed

reservoirs being to exclude sunshine rather than air, they should be effectually ventilated.

Dr. Kemna (Antwerp), Mr. W. Whitaker (London), Mr. C. E. Jones (Leyton), and others took part in the discussion of the paper.

Electrically-Driven Pumping Plant for Water Supply.

Mr. J. Hutton (Scarborough) read a paper on electrically-driven pumping plant for water supply and storage of water under pressure. He said this was a description of a pumping plant with reservoirs, etc., recently installed by him for the water supply of the village of Wykeham, Yorks, and for a nobleman's residence in that district.

It was at first proposed to use a windmill, but the high initial cost and unsightly appearance of these otherwise useful appliances decided him to recommend the use of an electric motor, worked by current obtained from the electric plant primarily installed for the lighting of Wykeham Abbey, which is situated about 1,200 yards from the spring. The motor is automatically controlled, so that no continuous attention is required, and the reservoir is continuously kept full. The well, generating-station, and reservoir are situated at the three corners of a triangle, the sides of which are from 800 to 1,200 yards in length.

The generating plant—which consists of loco-type boiler with enlarged fire-box for burning inferior fuel; a compound medium-speed engine by Robey & Co., of Lincoln, developing 40 b.h.p.; dynamos; booster; and 200-volt storage battery with a capacity of 470 ampere hours—is of the type usually adopted for electric-lighting. Current is conveyed from the generating plant to the pump motor through a concentric cable carried underground. The pumping plant consists of a three-throw pump with pistons 4 in. diameter by 6-in. stroke, working at a speed of 60 ft. per minute. The reservoir is situated 900 yds. from the pump-house, and is supplied through a 3-in. cast-iron pumping main.

The water-level in the well is 8 ft. below the surface of the ground, and the spring gives a supply of 90 gallons of water per minute, which is fairly constant all the year round.

The reservoir, built of blue bricks in cement, has a capacity of 45,000 gallons, and is divided into two parts in order that cleaning operations and repairs may not involve the stoppage of the supply. The total head against which the water is pumped is 98 ft., and the pump normally delivers 3,500 gallons per hour.

At the reservoir all supply and delivery valves are duplicated, and, in addition to the Wykeham village supply, a 5-in. main is carried to Wykeham Abbey, a distance of 900 yds., furnishing the ordinary water supply, in addition to feeding sixteen fire-hydrants placed round and inside the Abbey.

The plant, which has now been in operation for over a year, has quite equalled the author's expectations, having worked constantly without a hitch. The cost of the working has been found to be exceedingly low, and although it is somewhat difficult to give exact figures, owing to the power being used for electric-lighting as well as pumping, the cost of the proportion of energy used by the plant in fuel certainly does not exceed a penny per 100,000 ft. gallons.

The author has since had occasion to design a similar plant for supplying a neighbouring village, which, being situated on the top of a hill, involved the building of a water-tower, etc., obtaining working head by other means. This plant is practically identical with that just described, except that in this case, instead of a float, a pressure switch is used, it being opened or closed as the air pressure on a diaphragm is increased or decreased.

The author ventures to think that the problem of using electrical power for pumping the water supply of towns and villages is one which must inevitably come prominently forward in the near future.

Mr. R. S. Lloyd, Mr. T. R. Smith, Mr. C. Sainty (Windsor), Mr. C. E. Jones (Leyton), and Mr. Hutton contributed to the discussion.

The meeting closed with the customary votes of thanks.

"WILLING'S PRESS GUIDE."—"Willing's Press Guide" for 1905 (published at 1s. at 125, Strand, W.C.) is the thirty-second annual issue of a very well-arranged and reliable work. The present issue has been revised, and for conciseness and clearness it leaves little or nothing to be desired.

THE POST OFFICE LONDON DIRECTORY.

PROBABLY no yearly publication is so well known in London as the "Post Office Directory," and certainly no similar work can equal it for usefulness or surpass it for accuracy. The issue for 1905—the 106th annual issue—which has just been published by Kelly's Directories, Ltd., 182-4, High Holborn, W.C. shows that the same care in its compilation has been taken which characterised previous issues, while this year the labours of its editors have been considerably increased, for with the Directory has been included a considerable section dealing with the London County suburbs. In the combined work, the "Post Office London Directory" has been kept distinct from the section dealing with the county suburbs, and remains much the same as before, but the complete volume will be found to cover the whole of the County of London—that is, for the first time, to include those areas which have been previously looked upon as beyond the scope of the "Post Office London Directory" itself. The complete volume contains in its two divisions 4,600 pages (exclusive of advertisements), but, by the use of a finer paper and the resetting of a portion of the county suburbs section, the bulk of the combined directories in one volume is not greatly in excess of the "London Directory" alone in its usual form. Still, the combined work may be found by some people to be inconveniently bulky, and, to meet this possible objection, the "London Directory" can be had in the same form as in past years, printed on the same paper, but, of course, brought up to date. Or if subscribers prefer to have the combined work they can obtain it in two volumes. The Directory has been brought well up to date and other additions include: A list of the Metropolitan Water Board and a large map of the suburbs of London. The new Education Act has caused the omission of the London School Board, and has also rendered necessary a re-arrangement of the elementary schools.

Rapidly as the Metropolis grows, its growth would be far greater, were it not for a tendency on the part of many of its inhabitants to take up their residence in the Home Counties. In order to meet the want which the publishers believe to exist, they propose issuing the Directory of the Six Home Counties more frequently. A new edition of the first volume—containing the counties of Kent, Surrey, and Sussex—will be published about the middle of 1905, followed in 1906 by a new edition of the second volume, containing the counties of Essex, Herts, and Middlesex. These books will include the whole of their respective counties outside the boundary of the County of London.

DIARIES, ETC.

FROM Messrs. Hudson & Kearns (83, Southwark-street, S.E.) we have received specimens of their special diary blotting pads, which are very attractive and serviceable productions of their kind. No. 8A is a specially useful form, containing, in addition to blotting pad, a calendar, a diary with index and a tear-off indicator, and space for memoranda of appointments. The Banker's pad is another useful form, as also is No. 4, a portfolio pad.

A useful diary for architects and surveyors is Messrs. Waterlow Brothers & Layton's "Architects', Surveyors' and Auctioneers' Diary and Almanac for 1905." It includes full lists of members of the Royal Institute of British Architects, the Surveyors' Institution, and other professional bodies; information as to provincial architectural societies, and Government and public offices; an abridgement of the Towns Improvement Clauses Act, 1847; the London Building Act, 1894; Regulations and rules as to applications for the L.C.C. sanction, etc., under the London Building Act; and a list of District Surveyors, with their offices. The diary also includes much additional information of use to architects, surveyors, and others, but sufficient has been said to indicate the usefulness of this excellent annual. It is a handy and well arranged work, and is published at Nos. 24 and 25, Birchin-lane, E.C., at 3s. 6d. and 6s., according to binding.

The "City Diary" is a little work which gives three days to a page, is interleaved with blotting-paper, and contains a great deal of City information. The "Diary" gives a complete list of members of the Corporation, ranged alphabetically, and also according to their wards; of the City churches, with the names of the rectors, curates, organists, and other officials; of the City companies, with the names of the clerks, and the situation of the halls; and of the various municipal, social, and parochial institutions that have their headquarters in, or are in any way associated with, the City. The work is issued at 1s., and the publishers are Messrs. W. H. & L. Collingridge, 148-9, Aldersgate-street.

Calvert's "Mechanics' Almanack and Workshop Companion for 1905" is the thirty-second year of publication of a useful little work for artisans and handicraftsmen. In addition to information usually found in an almanac, it contains nearly seventy pages of notes and data for those connected with mechanical, electrical, engineering, building, and other trades. It is published at 4d.

Messrs. Bemrose & Sons, Limited, Snow-hill, E.C., have sent us specimens of their tear-off Shakespearean, etc., calendars and monthly diary, the published price of which is 1s. each. The tear-off calendars are made to open out and stand upon a table, or they can be hung upon a wall.

Messrs. Sprague & Co., Limited (4 and 5, East Harding-street, E.C.), have again issued their excellent little diary and tables, as well as a flat pocket-book suitable for the breast pocket. Both are very neat and useful little issues. The present is the thirty-sixth annual edition of the diary.

The Builders' Accident Insurance Co., Limited (Bedford-street, W.C.), have sent us a neat little pocket-book and a date indicator, which, presumably, they have issued to their subscribers.

The "Gloucester" Diary and Directors' Calendar for 1905 is the tenth year of issue of a diary published by Mr. Brooke, of Gloucester, for The Gloucester Railway Carriage and Wagon Company, Limited. The chief feature of the work is a list of stations and junctions attended by the company's wagon repairers.

Messrs. George Wragge (Manchester) send us a very characteristic calendar designed for them by Mr. Sydney E. Castle. It is in twelve square sheets, one for each month, with specially designed lettering and borders, and a sketch in line at the side of each sheet, illustrating the various kinds of work which the firm carry out.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Bethnal Green Borough Council 14,481*l.* for purchase of land, etc.; Fulham Borough Council 16,800*l.* for acquisition and laying out of open space, and 7,700*l.* for baths and wash-houses; Guardians of Hackney Union 24,600*l.* for poor-law purposes; St. Pancras Borough Council 7,515*l.* for electric light installation; Shoreditch Borough Council 9,189*l.* for street improvements and paving works, and 1,255*l.* for street lighting purposes; and Woolwich Borough Council 15,000*l.* for street improvement.

Lack of Employment.—The General Purposes Committee brought up the following report, the recommendation being agreed to:—

"In our report dated December 12, 1904, now before the Council, we stated that we had considered a letter from the Central Committee of the London Unemployed Fund with regard to the provision of facilities for the creation of work of public utility, for genuine unemployed workmen, and that the matter was engaging the earnest consideration of the various committees. We have now to inform the Council that the committees have suggested certain works, such as digging, levelling, and preparing ground in connexion with the Council's parks, improvements, housing schemes, etc., which will afford employment of the nature suggested by the Central Committee. We should point out that in view of the distress prevailing, owing to the lack of employment, the various spending committees had already taken steps to put in hand during the winter months as large an amount of work as possible. In the result a considerable quantity is now in progress. In order that the several committees which are providing opportunities of work may proceed during the recess, we recommend—That the General Purposes Committee and the several committees which are providing opportunities of work to meet the exigencies of the unemployed in London be empowered to act during the recess, subject to the standing orders regarding expenditure."

Non-Provided Schools.—Replying to Mr. Pope, Sir J. W. Collins said the architect had now surveyed 332 non-provided schools, and the chief inspector had inspected 287 such schools, with regard to the staffing arrangements.

Enlargement of Royal-hill School, Greenwich.

—The following recommendation of the Education Committee was agreed to :—

"That the amended estimate of 4,415*l.* to be submitted by the Finance Committee in respect of the enlargement of the Royal-hill School (*Greenwich*) by 178 places, and of the other works proposed to be carried out at the same time in accordance with the finished plans approved by the Board of Education, be approved; . . . that the work be executed without the intervention of a contractor; and that the drawings, quantities, specification, and estimate of 4,080*l.* be referred to the Works Committee for that purpose."

Sanitary Works, Old Castle-street School, Whitechapel.—The following was also agreed to :—

"That, subject to the Board of Education approving the plans and specification, an estimate of 1,016*l.* 11*s.*, to be submitted by the Finance Committee in respect of the execution of sanitary and drainage works at the Old Castle-street School (*Whitechapel*), be approved; . . . and that the work be carried out without the intervention of a contractor as a jobbing work under the schedule in force for architectural jobbing works."

Proposed Adaptation of a House for Housewifery Centre, etc., Offord-road, Islington, S.—It was also agreed :—

"That the estimate of 603*l.*, to be submitted by the Finance Committee in respect of the proposed adaptation of the house, No. 6, Barnsbury-park, for the purposes of a housewifery centre and schoolkeeper's house in connexion with the Offord-road site (*Islington, S.*), be approved; that . . . the work be executed without the intervention of a contractor as a jobbing work under the schedule in force for architectural jobbing works; and that the drawings and specification be referred to the Works Committee for that purpose."

School, Monteith-road, Bow and Bromley.—On the recommendation of the Education Committee it was agreed that the estimate of 5,756*l.*, submitted by the Finance Committee, be approved; that expenditure not exceeding 5,969*l.* be sanctioned in respect of the erection of a school for the accommodation of 80 mentally defective children on the Monteith-road site (*Bow and Bromley*), and also in respect of the provision of a science-room and a drawing class-room in connexion with the graded school; that the work be executed by the Council without the intervention of a contractor. . . .

Roof Covers for Electric Cars.—The following recommendations were agreed to :—

"(*a*) That the estimate of 8,500*l.*, submitted by the Finance Committee, be approved; and that expenditure on capital account, of sums not exceeding that amount, be sanctioned in connexion with the provision of 100 additional roof-covers for the electric cars used on the London County Council Tramways.

"(*b*) That the 100 roof-covers for electric cars, referred to in the foregoing resolution, be constructed by the Council's tramway staff, under the supervision of the chief officer of tramways.

"(*c*) That an agreement be entered into with Messrs. Milnes, Voss, & Co. for the payment of a royalty of 4*l.* 10*s.* for each of the 100 roof-covers to be made by the Council for its electric cars; that the solicitor do prepare, and obtain the execution of, this agreement; and that the seal of the Council be affixed thereto when ready."

Storm Floodings—New Pumping-station in Battersea.—The Main Drainage Committee recommended and it was agreed :—

"That the estimate (No. 4,368) of 7,000*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be sanctioned on account of the cost of the erection and equipment of a pumping station, on a site at the junction of York-road and Creek-street, Battersea, for the purpose of relieving floodings in Wandsworth and Battersea."

Office Accommodation.—The Establishments Committee recommended, and it was agreed, that the alteration of the premises known as Nos. 56 to 60, Strand, be executed by the Council without the intervention of a contractor, and that the drawings, specification, and bills of quantities be referred to the Works Committee for that purpose. The amount of the architect's estimate is 3,502*l.*

Lee-green Fire Station.—The following recommendations of the Fire Brigade Committee were agreed to :—

"(*a*) That expenditure not exceeding 12,770*l.* be authorised in connexion with the establishment of the proposed new Lee-green fire-station.

"(*b*) That, in the event of the Works Committee being prepared to undertake the work at the amount of the architect's estimate (to be reported after the Christmas recess), the work of erecting the Lee-green station be executed by the Council without the intervention of a contractor, and that the drawings, quantities, specification, and architect's revised estimate be referred to the Works Committee for that purpose.

"(*c*) That, in the event of the Works Committee not being prepared to undertake the work of erecting the Lee-green station at the amount of the architect's estimate, tenders for the erection of the station be invited by public advertisement."

Housing.—It was agreed, on the recommendation of the Housing of the Working Classes Committee :—

"That the estimate of 10,000*l.*, submitted by the Finance Committee in respect of part of a contribution to be made by the Council towards the cost of the acquisition and clearance of property on the Brantome-place and Prospect-terrace areas, be approved; that a payment on account of 10,000*l.* to the Council of the Metropolitan Borough of St. Pancras in respect of the expense of carrying into effect the Brantome-place and Prospect-terrace (St. Pancras) schemes, 1896, be authorised."

Suggested Removal of Charing-cross Station.—A joint report was submitted by the Bridges and Improvements Committee on the reference made to consider the question of removing Charing-cross Railway Station to the south side of the river; to widen Hungerford Bridge; and to construct a double line of tramways over the bridge so as to link up the northern and southern systems of tramways. The Committee were of opinion that, having regard to the very large expense involved, and also having regard to the attitude of the South-Eastern Railway Company, there was no alternative but to advise the Council for the present not to give further consideration to the matter.

At the request of Mr. J. Burns the report was ordered to stand over until after the recess.

Paving.—The offer of Messrs. J. G. White & Co., Limited, to execute, at an estimated cost of 1,602*l.* 12*s.*, the paving and other works connected with the widening of Camberwell New-road, authorised by the London County Council (Tramways and Improvements) Act, 1901, was accepted.

It was also agreed that, in the event of the Works Committee being prepared to undertake, at the amount of the chief engineer's estimate, the execution of paving, etc., works connected with the widening of Blackheath-road, authorised by the London County Council (Improvements) Act, 1900, such works be effected by the Council without the intervention of a contractor.

It was agreed that the offer of the Council of the Metropolitan Borough of Battersea to undertake, at an estimated cost of 2,732*l.* 19*s.* 7*d.*, the paving and other works connected with the widening of York-road, between Edmond's-place and York-place, authorised by the London County Council (General Powers) Act, 1898, be accepted.

Main Drainage Extension and Storm Relief Works.—The Main Drainage Committee brought up the following report :—

"We think the Council may wish to be informed of the progress which has been made since March 31, 1904, in connexion with the scheme for the extension of the main drainage system and the scheme of flood relief works. The extension scheme . . . provided for additional main sewer accommodation in consequence of the large growth in population since the main drainage system was established. The estimated cost of the scheme is over 3,000,000*l.*; and the actual or estimated cost of works completed or in progress amounted on March 31, 1904, to 1,014,460*l.* Since that date the construction of the final section (E) of the new northern outfall sewer has been undertaken by the Works Committee, and work has already been commenced. The new sewer will extend from Old Ford to Barking. The length of section E, which extends from a point near East Ham manorway to the outfall works at Barking, is about 1¼ miles, and the estimated cost is 147,280*l.* The tender, amounting to 82,510*l.* 2*s.* 4*d.*, of Messrs. W. Kennedy, Limited, for the construction of section No. 1 of the northern low-level sewer No. 2 has been accepted, and work has been commenced. This new sewer will extend from Hammersmith to Bow, and section No. 1 comprises the portion between the River Lee, near Bow-bridge, and the western side of the Regent's Canal at Limehouse. The tender, amounting to 348,417*l.*, of the Westminster Construction Company, for the construction of section D of the southern outfall sewer No. 2, has been accepted, and the work is about to be commenced. The new sewer will extend from the Crossness outfall works to the Deptford pumping-station; and section D, which is about 4¼ miles in length, comprises the portion of the sewer from Deptford pumping-station to a point near Plumstead Railway Station. The tender, amounting to 81,285*l.* 19*s.*, of the Westminster Construction Company, for the construction at Plumstead of a portion of the new southern outfall sewer No. 2 and of a portion of the new high-level sewer No. 2, has also been accepted; and under this contract, known as contract C, two sewers, each nearly half a mile in length, will be constructed, and the work has already been commenced. The borings for the portion of the new high-level sewer No. 2 between Plumstead and Catford, and for the new low-level sewer from Hyde Park-corner to Stepney, have been completed, and the surveys and drawings are well advanced. It is hoped that the contract for the sewer from Plumstead to Catford will be ready for letting in March next; and this sewer, when completed, will relieve the floodings in Loampit-vale, Lewisham. As regards the scheme of flood relief works, upon which we reported on February 16 and 23, 1904, considerable progress has been made. Application is being made to the Secretary of State for power to acquire compulsorily certain land required for the site of a new pumping-station at the junction of York-road and Creek-street, Battersea. A similar application is being made with regard to land required for a site for a new pumping-station at Shad Thames, Bermondsey, and the drawings and surveys for the new sewers in connexion with this station are well advanced. The tender, amounting to 30,713*l.* 8*s.* 7*d.*, of Mr. D. R. Paterson, for the construction of a sewer about 1¼ miles in length from Cornwall-road, Notting-hill, to Upper Addison-gardens, Kensington, has been accepted; and this sewer, when constructed, will relieve the floodings in North Kensington. Messrs. J. D. Nowell & Sons' tender, amounting to 41,978*l.* 13*s.* 6*d.*, has been accepted for the construction of sewers, about 1¼ miles in length, from the junction of South-street with High-street, Wandsworth, to the junction of Varden's-road with North-side, Wandsworth-common, and thence to the site of the new pumping-station, above referred to, at the junction of York-road and Creek-street, Battersea. The drawings for this pumping-station are being prepared; and in response to an advertisement tenders have been received for the supply of the gas engines which will be required at the pumping-station. Tenders are also being invited from selected firms for the supply of centrifugal pumps, which will have to be connected with the engines at the pumping-station. This station and the sewers to be constructed in connexion therewith will provide relief for the floodings in Wandsworth and Battersea. The plans for the new relief sewer from Holloway to the Thames are being prepared, and negotiations are in progress with respect to the land required. The plans for the relief sewer, about 1¼ miles in length, from Hornsey and Stroud-green, have been completed, and tenders will be invited as soon as the Council is in a position to proceed with the work. A plan, showing the several works referred to in this report, will be sent to members of the Council."

New Theatre, Shaftesbury-avenue.—The Theatres and Music-halls Committee reported that they had considered plans, submitted by Mr. W. G. R. Sprague, of a theatre proposed to be erected at the junction of Shaftesbury-avenue and Rupert-street. The site does not strictly comply with the regulations, as only one-tenth abuts on to a street of 40 ft. in width instead of one-sixth as required, but in other respects the site is a good one. The proposed building is shown to have seating accommodation for 1,144 persons. The application was agreed to on certain conditions.

The Council at its rising adjourned until January 24.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Strand.—An iron and glass shelter at the main entrance to the "Coliseum" on the east side of St. Martin's-lane, Strand (Messrs. F. Matcham & Co. for the London Coliseum, Ltd.).—Consent.

Hammersmith.—That the Council do approve of the elevation of a proposed gangway over Wood-lane, Hammersmith (Mr. I. Kiralfy).—Agreed.

Hackney, North.—Buildings on a site on the north side of Manor-road, Stoke Newington, between No. 4 and the Great Eastern Railway (Messrs. Turner & Holditch for Messrs. H. Merritt & F. W. Matthews).—Consent.

Hackney, Central.—A two-story addition at the rear of No. 16, Stannard-road, Dalston, to abut upon Ritson-road (Messrs. J. Hunt & Sons for Mr. G. Withey).—Consent.

Brixton.†—Buildings on the site of Nos. 422 and 424, Coldharbour-lane, Brixton (Messrs. W. & J. Peacock for Mrs. M. J. Lockbart).—Consent.

Wandsworth.—Retention of one-story shops in front of Nos. 81 to 91 (odd numbers only), inclusive, Replingham-road, Southfields, Wandsworth (Mr. W. Hunt for Mr. J. R. Mayfield).—Consent.

Marylebone, West.—Permission to retain enclosures to a porch at No. 7, Mandeville-place, Wigmore-street, St. Marylebone (Mr. F. Cornelius-Wheeler).—Refused.

Wandsworth.—Four one-story shops on the east side of Cavendish-road, Wandsworth, abutting also upon the north side of Grove-road (Messrs. J. D. Mathew & Son for Mr. J. King).—Refused.

Width of Way.

Whitechapel.—A building on the west side of Charlotte-court, Fieldgate-street, Whitechapel, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. G. E. Nield for Mr. M. Abrahams).—Consent.

Battersea.†—Retention of a building at No. 110, Church-road, Battersea (Messrs. J. A. J. Woodward & Sons for Mr. J. Draper).—Consent.

Width of Way and Lines of Frontage.

Wandsworth.—Cottages, with bay-windows, on the site of "Swiss Cottage," Garratt-lane, Tooting (Mr. B. Woollard for Mr. C. Clements).—Consent.

St. Pancras, West.—A porch addition in front of "Rowton House," Arlington-road, Camden Town (Mr. G. J. Earle for Rowton Houses, Ltd.).—Refused.

Width of Way, Line of Frontage, and Construction.

Southwark, West.—A deviation from the plans approved for the erection of a luffing crane and platform on the north side of Bankside, and of a gangway across that street so far as relates to the erection of an enclosure to the crane tower (Mr. W. J. Perkins for Messrs. Harrisons & Crosfield).—Consent.

Deptford.—A wood and iron building on a site on the northern side of Trundley's-road, Deptford, eastward of the Grand Surrey Canal (Mr. L. A. Jouques).—Refused.

St. Pancras, South.—For permission to retain teak and glass enclosures to the sides of an iron gangway, connecting the third floors of premises on the north and south sides of Beaumont-place, Euston-road, St. Pancras (Messrs. Maple & Co., Ltd.).—Refused.

Formation of Streets.

Clapham.—That an order be issued to Mr. J. Cobeldick sanctioning the formation or laying out of new streets for carriage traffic upon the Heathfield estate, West Side, Clapham Common, Clapham.—Consent.

Clapham.—That the Council do not consent to the application of Mr. J. Cobeldick for an extension of the period within which new streets for carriage traffic upon the Heathfield estate, West Side, Clapham Common, Clapham, were required to be defined and thrown open to the public.—Agreed.

Wandsworth.—A barrier across Okeburn-road, Totterdown estate, Tooting (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Mile End.†—That an order be issued to Mr. A. Davis, sanctioning a new street for foot traffic only at the rear of houses in Hessel-street (late Morgan-street), Stepney.—Consent.

Deviations from Certified Plans.

Whitechapel.—Certain deviations from the plan certified by the District Surveyor, so far as relates to the proposed rebuilding of No. 1 and 2, Parliament-court, Artillery-lane, Whitechapel (Mr. G. H. Lovegrove).—Consent.

Means of Escape from the Top of High Buildings.

City of London.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the fifth and sixth (top) stories of Blocks "D" and "E" Broad-street-place, Eldon-street, City, for the persons dwelling or employed therein (Mr. G. D. Martin for the London Property Development Syndicate, Ltd.).—Consent.

Widening of Street, Width of Way, and Line of Frontage.

St. Pancras, North.—The erection of a building upon the site of Nos. 9, 11, 13, 15, and 17, Highgate-road, St. Pancras, to abut also upon Greenwood-place, and in connexion with such building the widening of a portion of Greenwood-place (Mr. G. H. Greatback for Mr. W. A. Curnock).—Consent.

Alteration to Buildings.

St. George, Hanover-square.—An alteration to Nos. 1 and 2, Thomas-street, Oxford-street, St. George, Hanover-square, so far only, however, as relates to the proposed construction of a bay-window at the rear of the premises, without such premises being in conformity with Part V. of the Act (Mr. L. Sharp for Mr. E. J. Rossiter).—Consent.

Space at Rear.

Wandsworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the northern side of Garratt-lane, Tooting, with an irregular open space at the rear (Mr. B. Woollard for Mr. C. Clements).—Consent.

St. Pancras, East.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at the rear of the "Mother Red Cap" public-house, No. 174, High-street, Camden Town (Messrs. F. J. Eedle & Meyers for Mr. E. L. Summers). Refused.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

NORTHAMPTON ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—The Annual Meeting has just been held of the Architectural and Archæological Society for the Archdeaconries of Northampton and Oakham. The Rev. A. W. Pulteney presided, and Mr. R. P. Brereton gave an address on "Some Unrecorded Saxon Work in Churches in the Neighbourhood of Peterborough." Mr. Brereton prefaced his remarks with an explanation of a recently published book on pre-Conquest work, by Professor Baldwin Brown. In that book Northamptonshire figured, so far as numbers were concerned, fourth in England; but Mr. Brereton thought it would be agreed that in point of importance and general interest Northamptonshire stood second to none. Nine instances of Saxon work in churches in the county were given. These churches were Brixworth, which was the most complete, if not the most ancient, Saxon church Northamptonshire possessed; Earl's Barton, which contained the finest Saxon ornament known; Barnack, Brigstock, Whittering, Geddington, with its almost, if not quite, unique arcade; Pattishall, Stowe-nine-Churches, and Green's Norton. The chancel at Stowe was certainly Saxon, and a very fine example, but the whole tower ought to be added as an example of Saxon building. It might not strike an observer as such, however, by its appearance, and the natural inference would be that the tower was a recent addition. The nave of the very fine church at Green's Norton was well preserved. There were other examples in Northamptonshire of which no notice had been taken in the book to which Mr. Brereton had referred, two in particular. At Nassington there was an opening of a very decided Saxon character with a triangular head, and there were in the south aisle wall through-stones of typical long and short Saxon work. Another church, Wansford, possessed good specimens, which, if post-Conquest in point of date, were pre-Conquest in regard to style. Woodstone west window was also Saxon. At Thornhaugh there was an example which had previously been quite unobserved and unrecorded. Another interesting specimen—an ornament—had recently been discovered in the crypt of the church at Oundle. Mr. C. A. Markham, F.S.A., read a paper on "The XIVth Century Manor House at Yardley Hastings." This interesting and unique fragment of a bygone age, said Mr. Markham, once formed part of the large and important Manor House. It was probably erected by John Lord Hastings about 1330.—The annual report of the secretary was presented by Mr. C. A. Markham, and the Rev. E. L. Tuson, M.A., presented the financial statement. The officers and committee were re-elected *en bloc*, on the proposition of the Rev. A. O. James, seconded by Rev. R. G. Randolph.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On the 14th inst. Mr. Nelson Dawson, London, addressed the members of the Edinburgh Architectural Association on the subject of metal work. The meeting was held in the Lecture Hall of the Geographical Society, instead of the Architectural Association's own rooms in George-street, and Mr. H. O. Tarbolton presided. Mr. Dawson's lecture was illustrated by lantern slides of examples of iron, silver, gold, and enamel work. At the close, Professor Baldwin Brown moved a vote of thanks to the lecturer. He made a passing reference to the proposal to utilise the Royal High School buildings for the purposes of art, remarking that whatever difference of opinion there might be regarding the suitableness of the buildings for that purpose—and there was room for difference of opinion—they were all agreed that there must be no tampering with the exterior of the Royal High School. Mr. Ross seconded, and Mrs. Traquair supported the vote of thanks, which was cordially awarded.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of the Society on Thursday, the 15th inst., Professor Capper, of Manchester University, read a paper on "Choisy's Researches in Ancient Building Construction," Mr. G. B. Bulmer, President, in the chair. The lecturer said that Choisy's researches into ancient Egyptian building construction follow his previous detailed studies, along similar lines, of Roman and Byzantine work, extending over a period of more than thirty years. To Egypt he has brought the same power of penetrating analysis of constructive fact, the same keen insight into the practical necessities of building organisation and method, that illumined so admirably his account of ancient Roman building, as well as of the succeeding school of architecture at Byzantium. Choisy's researches in Egypt, though not apparently the result of prolonged residence, and suffering from a curious ignorance of much recent work on Egypt and new data so derived, give undoubtedly an epoch-making study, presenting some well-known facts in altogether new relationships, and giving us daring and reasoned solutions for many problems hitherto apparently insoluble even to experienced Egyptologists. As one of the most important of these solutions of long-standing enigmas, the lecturer gave in detail, with lantern illustrations from Choisy's book, the minute study of Egyptian brick walls, built with undulating bedding, a puzzle that has hitherto baffled every inquirer. As demonstrated by Choisy, these curious walls, which occur on a large scale at Karnak, Abydos, El Kab, Philæ, and elsewhere, are the logical outcome of Egyptian crude-brick building on sloping sites, given the scanty foundations possible in Egyptian soil, where these walls are liable to attack by the waters of the Nile. Similarly Choisy, by a single illuminating paragraph, accounts for the well-known bench on the sides of the ascending gallery in the Great Pyramid, admittedly unexplained in Professor Flinders Petrie's classical book on Gizeh. The lecturer then gave an account of Choisy's explanation of the transport of material, whether in the enormous blocks of obelisk or colossal statue or of the materials of more moderate dimensions used in ordinary building, and of his very ingenious demonstration of the use of sand for the nice adjustment of the great blocks in position.

MANCHESTER SOCIETY OF ARCHITECTS.—The forty-first annual dinner was held on the 16th inst., at the Queen's Hotel, of the Manchester Society of Architects. Mr. J. W. Beaumont, President of the Society, occupied the chair. In submitting the toast of "The Royal Institute of British Architects," the President said that at the present time there was no country in the civilised world in which there was not a member of the Royal Institute of British Architects. If the registration of architects became law the Institute would become the registering and examining body. But if this did not come to pass the Institute was intending to take into more serious consideration the education of architectural students, upon which the good of the profession seemed to him to stand. Mr. T. E. Collcutt, Vice-President of the Institute, and Mr. John Slater responded to the toast. Mr. A. J. Murgatroyd proposed "The Victoria University of Manchester." Vice-Chancellor Hopkinson, in his reply, said nothing had given him more satisfaction than to know that the School of Architecture was an accomplished fact. The manner in which it had been started was a model of how things ought to be done in Manchester. The University and the Manchester Society of Architects had worked harmoniously together from the first, and he could not fail to acknowledge the obligations of the University to the two representatives of the architectural profession—Mr. Beaumont and Mr. Ogden. Dr. Hopkinson regarded the fact of the University and the architectural profession working together as one of the indications that Manchester recognised there was a future for English architecture and that that future would only be brought about by the union of architectural skill and knowledge, artistic study, and talent with those who were engaged in theoretical studies, the study of letters and of history.—The toast of "The Architectural Association" was proposed by Mr. Charles Heathcote and responded to by Mr. E. Guy Dawber (President of the Association). Mr. Alfred Darbyshire proposed "The Manchester School of Architecture," and Mr. Charles Rowley replied. Mr. Rowley pointed to the successful working of the school as an augury of still better things for architecture and a love of the beautiful in Manchester. He was quite certain, he said, that in Manchester there were some of the finest buildings to be found in any city.

ULSTER SOCIETY OF ARCHITECTS.—The annual dinner of the Ulster Society of Architects was held in Ye Olde Castle Restaurant on the 15th inst. Previously the annual general meeting of the Society had been held in its offices, 13, Lombard-street, under the presidency of Mr. W. J. Gilliland. The report of the Council and of the honorary treasurer's account were of a satisfactory nature. The following office-bearers and council were elected:—President, Mr. W. J. Gilliland; vice-president, Mr. J. J. M'Donnell; honorary secretary, Mr. W. B. Fennell; assistant honorory secretary, Mr. W. W. H. Patterson; honorary treasurer, Mr. F. H. Tulloch; council, Messrs. H. Seaver, N. Fitzsimmons, and R. M. Young; associate members of the council, Messrs. Thomas Houston and E. R. Kennedy; auditors, Messrs. Vincent Craig and J. St. J. Phillips. Mr. Benjamin Morrison was elected a student of the Society. At the dinner Mr. W. J. Gilliland again presided. The usual loyal toasts having been submitted from the chair and honoured, that of "The Learned Professions" was submitted by Sir Thomas Drew. Rev. Dr. Hamilton, in reply, mentioned the great service rendered to the nation in the capacity of architect by Sir Thomas Drew, and said that lately he had the distinction of being the architect of the new cathedral in Belfast. It seemed to him that of all the professions

having a claim to be included in that toast architecture stood out prominently. Their President made an admirable statement, adducing almost irrefutable arguments before the Royal Commission on University Education in Ireland two or three years ago, when he preferred a strong claim for suitable training of candidates in architecture. Mr. Gilliland asked that in any arrangements made for the development of university education architecture should have an acknowledged place, and that a Chair of Architecture should be provided for it in Queen's College. He (Dr. Hamilton) hoped the time would come when a great change would be made in all the university arrangements, and when that time came, he hoped the architects would receive the recognition to which they are justly entitled, and that a profession which has done so much for the health of the people would be admitted to the position it ought to hold in the learned professions. The toast was acknowledged also by Dr. Calwell, President of the Ulster Medical Association. Mr. Vincent Craig then proposed "The Royal Institute of Architects of Ireland," testifying to the efficient guidance of the parent body, and response was made by Mr. Mitchell (President) and Mr. Orpen (Honorary Secretary). Mr. R. M. Young, J.P., submitted the next toast, that of "The City and Trade of Belfast," Messrs. A. Cooke, H. A. Cutler (City Surveyor), and R. B. Henry responding. The toast of "Our Guests," submitted by Mr. Henry Seaver, had associated with it the names of Professor Symington, President of the Natural History and Philosophical Society, and Mr. John Vinycomb, President of the Ulster Arts Club. President Hamilton proposed the toast of "The President of the Ulster Society of Architects," and Mr. Gilliland briefly responded.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—At the meeting on December 20, Mr. Arnold Mitchell gave an address on "The Study of Mediæval Architecture." Commencing with an illustration of the nave of Southwell Minster he emphasised the nobility of Norman architecture and the way in which the builders had grasped the great principles, such, for example, as the desirability of massing the ornament and of ornamenting construction. The ornament is of the simplest and easily made with the axe on the small stones employed, and yet it is effective; the orders of the arches were recessed owing to the small size of the stones, each order being composed of one stone. The small size of the stones played a very great part in the construction of XIIth century buildings, since the piers were, in consequence, far larger than was otherwise necessary, and the roofs of naves could not be vaulted. Mr. Mitchell then traced the growth of vaulting from the "concrete dome" of the crypt at Canterbury to the quadripartite ribbed groined vault over the aisles at Peterborough, and so on to the vaults over the Chapel of Henry VII. in Westminster Abbey, and at Cowdray Castle, which have again become ornamented domes unsupported by the ribs. The ribs were at first introduced to support the groins, but were multiplied until they only ornamented the vault, and did not support it. Dealing with the arch, Mr. Mitchell showed the growth from the triangular arch built of Roman tiles at Colchester to the semi-circular arch also formed of Roman tiles at Brinworth, until the true arch with voussoirs was built. The triangular arch of tiles was no better than two concrete beams laid sloping, with a vertical joint at the head, and the semi-circular arch of tiles was supported by mortar voussoirs separated by tiles, since they alone had the correct shape. The arch became sub-divided into two lights by smaller arches, and the tympanum was at first ornamented simply as in the westernmost bays of the triforium on the north side of the choir at Peterborough, but later was pierced as in the eastern most bays, and from this sprang window-tracery, or ornamented with sculpture, as in the "Priest's" door, at Ely.

Mr. Francis Bond, in proposing a vote of thanks to Mr. Mitchell, suggested that the arches were built in recessed orders in order to save centring, wrought wood being scarce, and that the same cause may have been the reason why the greater spans in our cathedrals were not vaulted; while the small size of the stones used may have been caused by the bad state of the roads rendering the carriage of large blocks impossible. Mr. T. C. Yates seconded the vote of thanks, and referred to the traces of colour and gilding he had found when measuring the Angel Choir at Lincoln. Mr. R. Wellbye thought the Roman roads would still be in good condition in the great building period. The next meeting will be held on January 10, when Mr. W. M. Dodson will lecture on St. David's Cathedral.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The second meeting of the session was held at the rooms, 32, Sackville-street, Piccadilly, on Wednesday, December 14, at 8 p.m., Dr. W. de Gray Birch, the Treasurer, in the chair. Dr. Winstone exhibited a fine pewter tankard and drinking cup, both bearing the pewter stamp, and seemingly of the XVIIth century, the tankard being the older of the two. Dr. Birch, having examined the coat of arms upon them, expressed the opinion that they had belonged to the Kent branch of the Baker family. Dr. Winstone also exhibited a very nice example of Battersea ware in the shape of an oblong snuff-box and the Rev. Dr. Astley a circular box, enamelled on copper, similar in character to the Battersea specimen, but which, Dr. Birch said, was of German make and intended for sweetmeats; both were of the XVIIIth century. Rev. Dr. Astley exhibited, on behalf of Mr. Selley, some interesting finds from the Bristol neighbourhood, including a stone knife and flint implements, and a perfect pigmy arrow head. The Chairman exhibited a Cypriote antiquity of about 500 B.C., found by Cesnola, consisting of a rude kind of toy horse of clay, in perfect condition.—Mr. Emanuel Green read a paper upon "Bath old Bridge and the Chapel thereon," which had special interest for the meeting as the recent Congress had been held in that city. The question of the origin of early bridges, he said, is of interest, as, possibly, leading to a knowledge of some curious point or episode in local or personal history. Any very early notice, however, could only be met with by chance. On making a reference to local histories it would be found that the writers said little or nothing of the bridges, necessarily so, because nothing was known about them, yet, notwithstanding, bridges and bridge building were matters of public importance and of general taxation from which no one could be excused. Ducange mentions a guild of bridge builders known as Fratres Pontis, the habit worn being white with a cross on the breast. The *Saxon Chronicle* tells us that after his attack on London, 1013 A.D., King Sweyne went "westward to Bath and sat there with his force." To him came the Western Thanes and submitted and gave him hostages. Whether any Thane crossed the Avon by a bridge or by a ford there was no mention. Florence, of Worcester, and others, mention the coming of a party from Bristol, in rebellion against William Rufus, when Bath was burned and pillaged, but there was no intimation that it was approached by a bridge. In 1209, 1212, 1213, and again in 1216 when King John came to Bath, he must have crossed the river, but there was no reference to a bridge or a ford. Licences for pontage, *i.e.*, a duty paid on all articles carried across a bridge, could be occasionally found for other cities, Bristol, for example, but there was not one for Bath. This arose from the fact that the early bridge there was at some distance from the south gate, was not united to it and did not form actually a part of the city. The first and only early mention of a bridge at Bath was in 1273, in the Hundred Rolls, Edward I., but there must, with fair certainty, have been a bridge before that date, probably, built mostly of wood. The early local historians knowing nothing of the early bridge were in difficulties, and their descriptions of the bridge and chapel are quite inaccurate. The chapel spoken of by them was built upon one of the piers of the bridge, and was too small to have been anything more than a resting place for some painting or image, or a housing (to use a word found in early writings), or a place for a passing prayer. The paper was illustrated by reproductions of the unique and exquisite views, now in the British Museum, which were taken in 1718; they preserve for us a clear idea of the structure, chapel, piers, gate, and abutments complete. The Chairman, Mr. Kershaw, Mr. Gould, Rev. Dr. Astley, Mr. Bagster, Mr. Patrick, and others joined in the discussion which followed.

QUEEN VICTORIA MEMORIAL, SHEFFIELD.—The erection of the Sheffield memorial to the late Queen is now nearing completion. Mr. Alfred Turner is the sculptor of the monument.

THE TRAMWAY AND LIGHT RAILWAY ASSOCIATION.

ON December 16 a visit was made by the members of this Association to the works of the Great Northern and City Railway, and of the City and South London Railway.

The Great Northern and City Railway, as most of our readers are aware, is a low-level tubular line with one terminus at Finsbury Park, beneath the Great Northern Railway station, and the other at Moorgate-street, with intermediate stations at Drayton-park, Highbury, Essex-road, and Old-street. The tunnels are the largest of the kind hitherto constructed in London, being 16 ft. in diameter. Therefore, it is possible to take main-line vehicles, or even the largest Pullman cars, into the tubes. The diameter of the station tunnels is 21 ft. in the case of intermediate stations, and 23 ft. at each terminus. The crossover just outside Moorgate-street station is 32 ft. high by 30 ft. wide.

In the construction of the running tunnels a new method was introduced, on a considerable length of the line, by forming the lower half of the ring of brickwork, the upper half being of the ordinary cast-iron segments. This arrangement was proposed by Mr. E. W. Moir, M.Inst.C.E., and, we are informed by the officials, that it gives a more elastic roadbed than is the case where iron segments are used entirely. A noticeable feature is that, throughout the line, no combustible materials were used in the tunnel or platform construction. The rolling stock consists of motor and trailer cars, made up into trains of various lengths to meet the traffic requirements. Each motor-car is fitted with two 125 h.-p. motors, the controlling gear of which is placed in a fireproof compartment at the end of the coach. All the cars are fitted with Westinghouse quick-acting brakes, and each motor-car carries an automatic, motor-driven compressor. The sidings, car-sheds, and repair shops are situated at Drayton-park, where the line emerges into the open air. Of the lifts provided for conveying passengers to and from the trains, those at Moorgate-street and Essex-road are electrically-driven by motors placed over the lift shaft. At Highbury and Finsbury Park stations they are of the direct-acting hydraulic type.

On arrival at Moorgate-street station, the visitors were met by Mr. R. P. Brousson, the Engineer and Traffic Manager of the Great Northern and City Railway, by whom the working of the line was explained at length. After inspecting examples of the rolling stock the party proceeded to the crossover outside the terminus, where the most interesting feature is the arrangement of the running rails and electric conductors. Contrary to the ordinary practice, two conductors, negative and positive respectively, are employed, both of these rails being electrically insulated. Current is collected by eight slippers attached to each motor-car, two being placed at each end, and four at intermediate positions, so as to bridge over gaps at points and junctions. The party next visited a typical signal cabin at Old-street station, where the method of signalling was clearly demonstrated. The system employed is entirely automatic, and has a "treadle" control worked by the cars, the necessary low-voltage current being supplied from the running rails of the permanent way. A train entering any section controlled by a signal sets this signal to danger, and locks it until the train has passed out of the section, when a controlling relay is energised, and the last coach makes contact with the treadle and releases the signal. It should be noted, however, that the signal in advance must have been placed in the danger position before the signal in the rear can be operated by the treadle. From Essex-road station the visitors walked to the generating station, situated on the southern bank of the Regent's Canal, close to the New North-road bridge. Outside the power-house, a building on an L-shaped plan, and close to the canal bank, are a coal bin, an ash bunker and shoot, and a small pumping station. Coals are unloaded from barges by a Hone's grab, delivered into the bin, and mechanically conveyed to the coal bunker inside the boiler-house, all the coal passing through an automatic weighing-machine on its way to the bunker. When required, the same conveyor brings back ashes, which are delivered into the bunker, whence they are loaded up into barges or carts by means of the shoot. The pumping station is situated below the coal bin, and draws water from a well, for augmenting the ordinary supply, and for use in case the latter should be interrupted. Near the pumping-house is a vertical shaft, at the bottom of which a heading runs to the railway tunnels at a point between Essex-road and Old-street stations. The heading serves as a conduit for the electric cables, as well as to convey fresh air, propelled by a fan, into the railway tunnels for

ventilation purposes. In view of the large cross-section of the tunnels, and of the fact that the greatest underground length is not more than two and a half miles, it is believed that this heading will be adequate for the provision of fresh air. Another favourable circumstance is that the openings between the two tubes are strictly limited, both in size and in number. Hence the movement of the trains will afford considerable help in the way of ventilation.

The generating plant consists of four Musgrave vertical, cross-compound, condensing engines, each of 1,250 i.h.p., direct-coupled to British Thomson-Houston direct-current, compound-wound generators placed between the high and low-pressure cylinders, and furnishing 575-volt current at full load. Two auxiliary generators, driven by high-speed Davy-Paxman engines, supply current for lighting. These generators are rated at 120 kw. each, and give the same voltage as the main generators. The main switchboard is arranged so that, if necessary, the lighting circuits can be supplied from the traction panels. The steam generating plant includes ten "Economic" type boilers, each capable of evaporating 11,200 lbs. of water per hour. The boilers are fitted with Vicar's mechanical stokers, driven by electric motors in the basement. The stokers are fed from the coal bunker at the top of the boiler-house, the storage capacity of the bunker being about 1,000 tons. Ashes are raked from the boilers into hoppers below the floor of the boiler-house, each hopper having a valve at the lower end which discharges into the conveyor buckets. Messrs S. Pearson & Son were the contractors for the construction and equipment of the line, under the supervision of Sir Douglas Fox as consulting engineer.

The members of the Association next paid a visit, at the invitation of Mr. Thomas C. Jenkin, the general manager, to the new power station of the City and South London Railway, at Stockwell. The original generating station contained four 400 h.-p. generating sets, but the extension of the line to Clapham Common and the further extension to Islington, necessitated a great increase of power, and more suitable means of conveying it to the trains. The two-wire system at first used became inadequate owing to the increased length of the line, heavier trains, and more rapid services. Hence the company decided to adopt the three-wire system, which, although largely used for electric lighting, had not been applied to traction.

About the same time, an entirely new power station was built, capable of extension to double its present capacity, the old generating station being dismantled and utilised for locomotive and repair shops. The new station is a brick and steel building, 200 ft. long by 90 ft. wide, the engine and boiler houses being practically under one roof. The power house contains fourteen dry-back marine type boilers, and seven generating sets, with a maximum engine capacity of 5,500 h.p. Part of the line is supplied with current at 500 volts direct from the generating station, but more distant sections are supplied from sub-stations at London Bridge and Islington, where current received at a potential of 1,000 volts is stepped down to 500 volts. At each point of supply, storage batteries are installed to provide for station lighting, and for working the electric lifts. The batteries also steady the generator loads, and are available for the supply of current in case of temporary interruption to the station supply. To afford accommodation for increasing traffic, more powerful and faster locomotives have been provided for hauling four-coach trains. Ten new four-coach trains of improved design have been brought into service, and the older cars are being reconstructed on similar lines. The rolling stock of the company now includes fifty-two locomotives and 140 coaches, as compared with fourteen locomotives and thirty coaches four years ago. In conclusion we may mention that the station tunnels at Islington and Clapham Common are each of 30 ft. diameter, and are the largest in the world.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Mr. T. Fairhurst as a sanitary inspector in the Metropolitan Borough of Southwark, and the temporary reappointment of Mr. W. Peverett as a sanitary inspector in the Metropolitan Borough of Hackney.

CHINGFORD OLD CHURCH.—The Rector of Chingford is desirous of obtaining contributions for repairs to the chancel, porch, and tower of Chingford Old Church, necessitated by the recent fall of the roof of the nave. Every effort will be made to preserve the picturesque character of the ruin, which was illustrated in the *Builder* of July 2 last.

WESTMINSTER CITY COUNCIL.

A SPECIAL meeting of this Council, convened for the purpose of receiving reports from the Highways and Works Committees as to providing further work for the unemployed, was held at the City Hall, Charing Cross-road, on Friday last week.

The Works Committee's report dealt with the advisability of at once repicking certain macadam roads in the City and the repaving of Exhibition-road with wood. The City Engineer stated that provision could be made for the employment of additional men by engaging additional steam-rollers for the repair of macadamised roads and by relaying wood pavements in various sections of Shaftesbury-avenue, Great Windmill-street, and Kensington-road with materials now in stock. The Committee recommended that the work should be put in hand at once; but in the case of Exhibition-road, they considered that the work was not a suitable undertaking to be put in hand for the relief of the unemployed. The Finance Committee submitted an estimate of 2,800*l.* in respect of the proposed work.

The Highways Committee's report stated that they were unable to find work for any more men as scavengers and road sweepers. After discussing the matter for nearly two hours the Council decided to agree to the recommendation of the Works Committee. This will mean that employment will be found at half-time for about 120 men.

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court was held at the Guildhall on Thursday in last week, the Lord Mayor presiding.

Tramways.—Alderman Sir J. Bell presented a petition, signed by over 3,000 ratepayers, asking the Corporation not to give their assent to the proposal of the London County Council to run tramways over Blackfriars Bridge and along the Victoria Embankment. There was also a petition from the Vestry of St. Anne's, Blackfriars, in favour of the scheme. Both petitions were referred to the Streets Committee.

The Streets Committee reported relative to the London County Council's application for the Corporation's assent to the tramways over Blackfriars Bridge, etc., and stated that they had adjourned the further consideration of the matter until after the first meeting in the New Year, in the hope that by that time the report of the Royal Commission on London Traffic would be in the hands of the Corporation.

Blackfriars Bridge.—Mr. Fortescue moved:—"That the Bridge House Estates Committee be instructed to consider the advisability of widening the north end of Blackfriars Bridge, so as to do away with the acute angle which now exists at its junction with the Thames Embankment, and thereby greatly facilitate the traffic at this dangerous point."—The motion was referred to the Streets Committee.

Fire Protection.—The Streets Committee reported having taken the necessary steps for the introduction of a Bill in the next session of Parliament empowering the Corporation to inspect all buildings and require owners to provide proper means of exit through the roof by fixed ladders and other methods of escape from fire.

Contracts.—It was agreed to accept a tender of Messrs. H. Greene & Sons, Ltd., for carpenters', plumbers', painters', smiths', and engineering jobbing works for three years from January 1 next at 17½ per cent. below schedule prices, and a further 5 per cent. discount for cash payments.

Building Act Amendment.—The following resolution, passed at a meeting of the Bartholomew Club, was submitted:—"That, in reference to the new Building Act Amendment Bill now being promoted by the London County Council, without consultation with the Corporation or the local and professional authorities, this meeting advises that the campaign adopted in the case of the London Building Act be agreed to, and that, if the Bill be pressed, the Lord Mayor be asked to call a public meeting of protest by the citizens at the Guildhall."—This was referred to the Streets Committee.

Underground Convenience.—In consequence of difficulties having arisen, the Streets Committee reported that they had abandoned the site in the Guildhall-yard, by St. Lawrence Jewry Church, for an underground convenience, and they recommended in lieu thereof that an underground convenience be constructed under Guildhall-buildings, opposite the City of London Court, at an estimated cost of 3,000*l.*—This was agreed to.

Duke's Head-passage.—The Improvements Committee reported again with reference to the proposed widening and converting of Duke's Head-passage into a carriage-way, between Ivy-lane and Paternoster-row, and recommended that no further action be taken in the matter.—Mr. S. J. Sandle moved that the matter be referred back to the Committee for further consideration, and this was carried.

City Surveyorship.—The Court sat in private to consider the election of a City Surveyor from the following selected candidates:—Mr. Frederick Brown, Mr. James Leonard Crouch, Mr. Sydney Perks, Mr. William H. Prescott, Mr. Frank Sumner. The voting resulted in the selection of Mr. Sydney Perks, of 5, Crown-court, Cheapside, E.C., formerly assistant to the Surveyor to the Board of Trade, and who has been in private practice since 1890.

Illustrations.

A CHRISTMAS VISION: AFTER TENNYSON.

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> In tracts of pasture sunny-warm,
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> Sat smiling, babe in arm."

The "branch-work of sardonyx" evidently has a kind of Byzantine suggestion, which the artist has followed in the framing of the picture, though his Virgin is perhaps somewhat too naturalistic a figure for the surroundings. However, we have the "Madonna della Seggiola" as a precedent.

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GRAMMAR SCHOOL, MARLBOROUGH.

THE new grammar school at Marlborough, built from the designs of Messrs. Silcock & Reay, of Bath, is intended to accommodate eighty scholars, forty boys and forty girls. It is built on the site of the old grammar school, but set a little further back from the road.

There are two entrances, one for boys and one for girls, with cloakrooms, changing-rooms, and lavatories attached, and the building contains on the ground floor a central assembly-hall, with four classrooms and teachers' room opening out of it, and on the first floor four classrooms, a lecture-room, and a music-room. The physic laboratory and cookery-room are on the ground floor, and the chemical laboratory and the art-room are on the first floor. There are two playgrounds, with a playshed and a bicycle-shed in each, and with a manual instruction-room in the boys' playground.

The building is heated by hot water, and rooms ventilated by means of extraction flues and inlet-ventilators.

The builders are Messrs. Downing & Rudman, of Chippenham, and the clerk of the works is Mr. A. H. Davies.

HOLY TRINITY CHURCH, SOUTHPORT.

THIS is a re-building of an already existing church at Southport. The drawing shows the design of the west end, which shows a rich and effective treatment, the west window having two orders of tracery, one outer one standing in front of and partially veiling the actual window tracery. The western façade of the nave is treated as a panelled stone screen, the gable rising behind it.

The estimated cost is 10,000*l.* for the nave and aisles, 7,000*l.* for the tower and west end, and 3,000*l.* for the morning chapel and transept.

The materials used are Bath stone for exterior dressings, Runcorn stone for internal arcades, and Chorley bricks for the brickwork.

The builders are Messrs. J. C. & F. Woods, of Bolton and Southport, and the architects Messrs. Matear & Simon, of Liverpool.

THE BUILDER. DECEMBER 24, 1904.

A. C. Conrade ver. 1904
OF THE MAD MOTHER BY A CRYSTAL STREAM
TRACTS OF SUNNY WARM
PASTURE
BENEATH BRANCH-WORK OF COSTLY SARDONYX
SAT SMILING, BABE IN ARM.
TENNYSON

INK-PHOTO, SPRAGUE & Co Ltd 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

A CHRISTMAS VISION: AFTER TENNYSON.—Drawn by Mr. A. C. Conrade.

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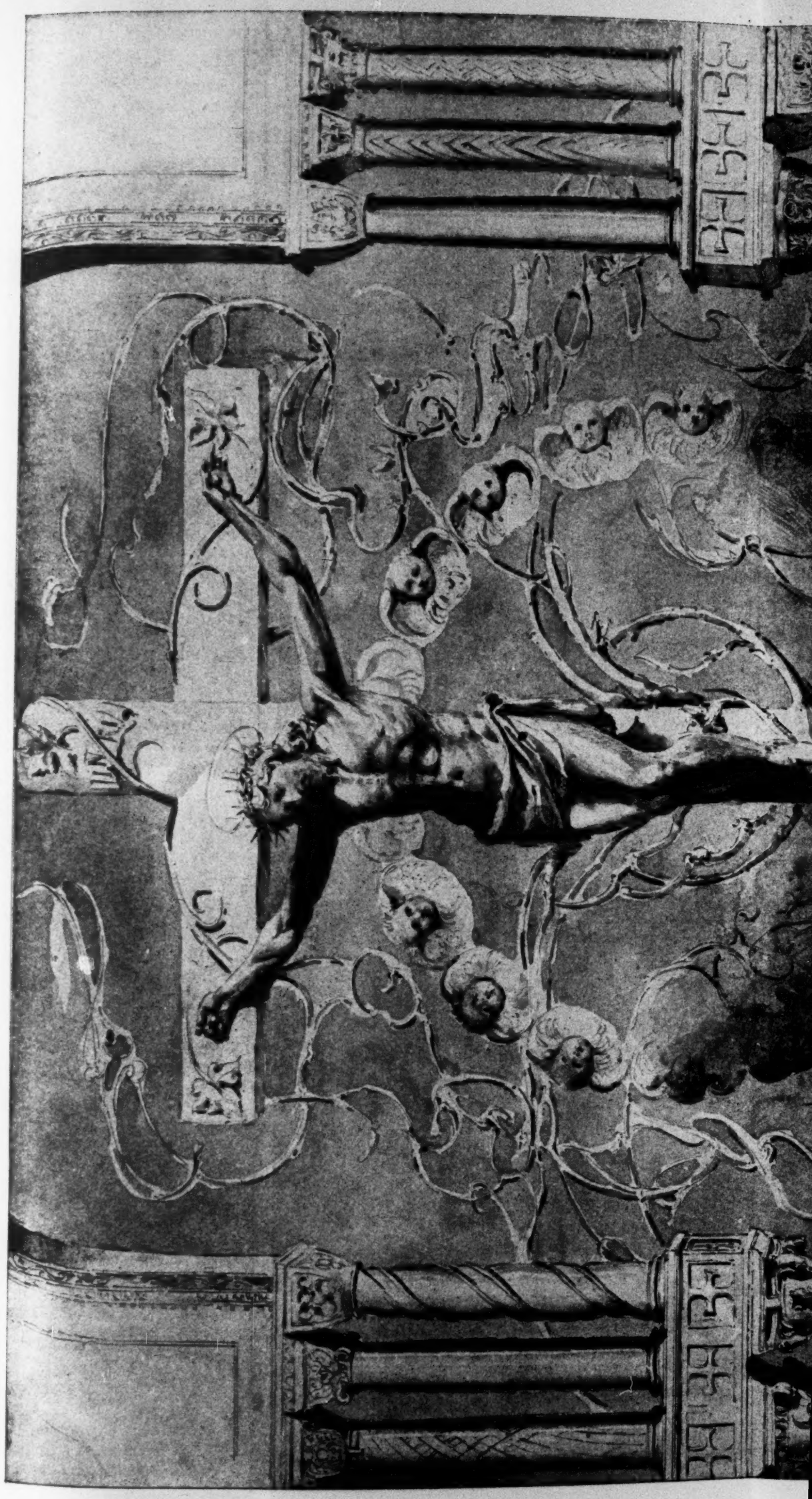

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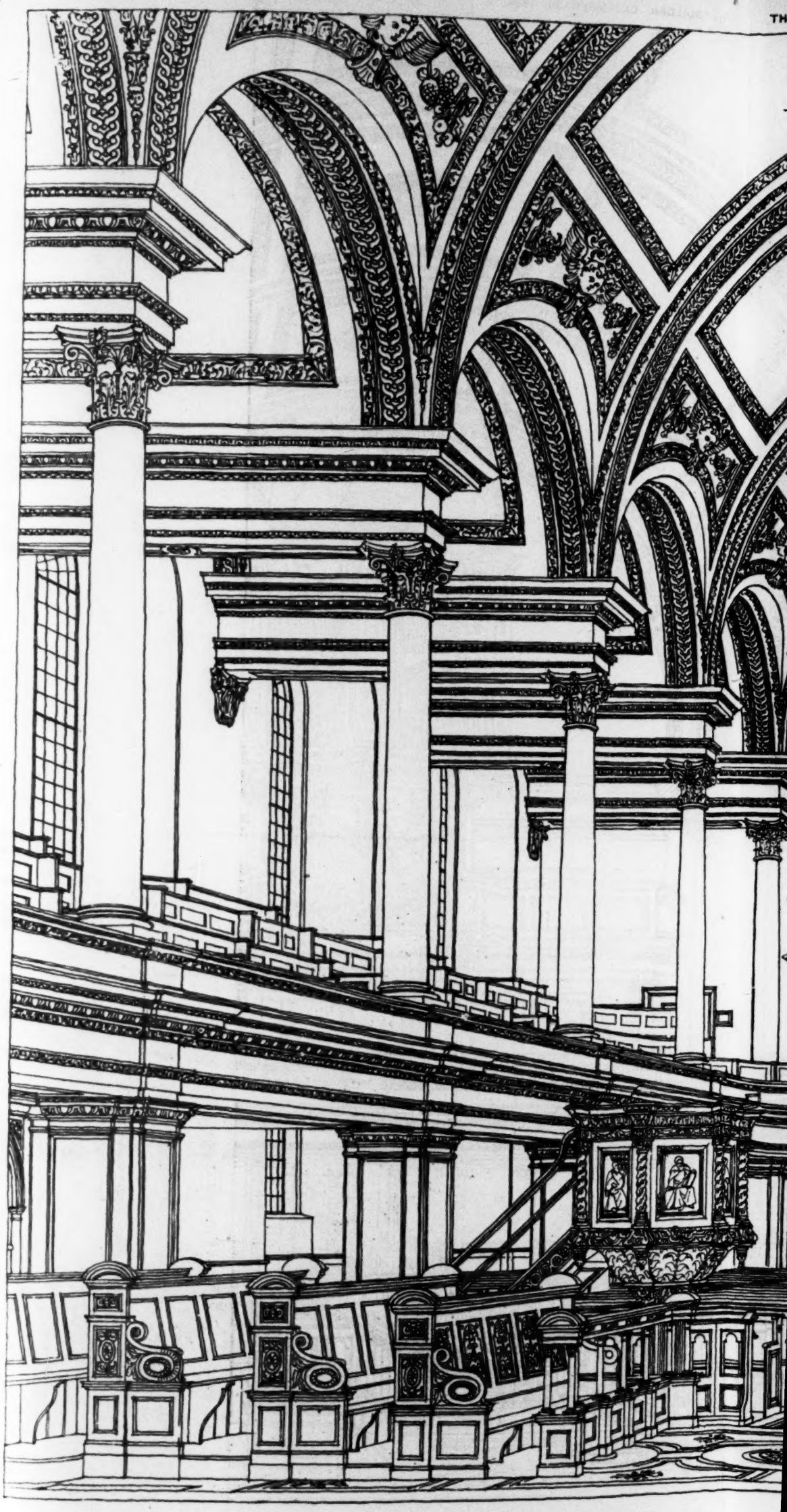


Prize for Perspective Drawing, Royal Academy, 1904.

ST. JAMES'S CHURCH, PICCADILLY:

DRAW

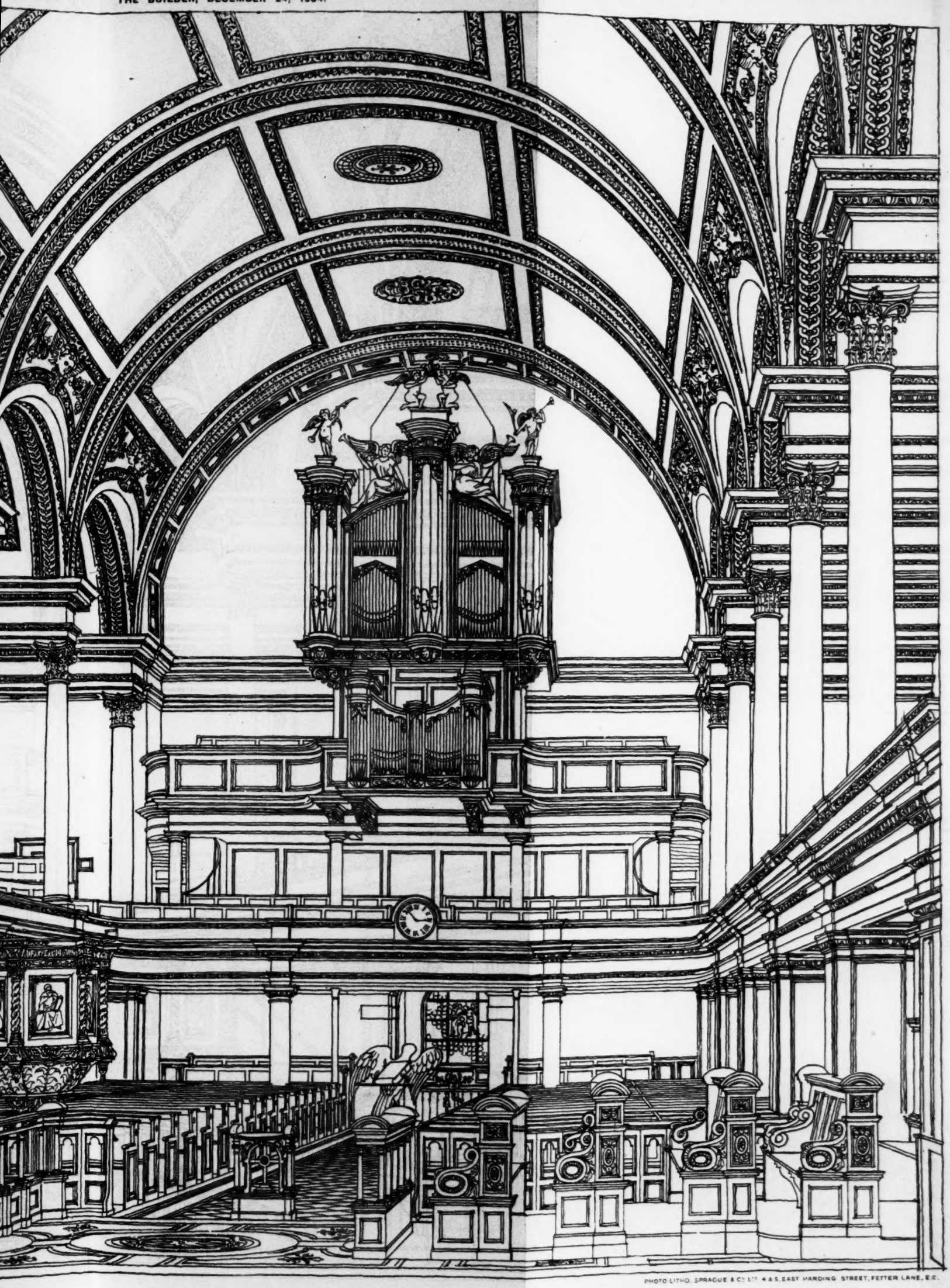
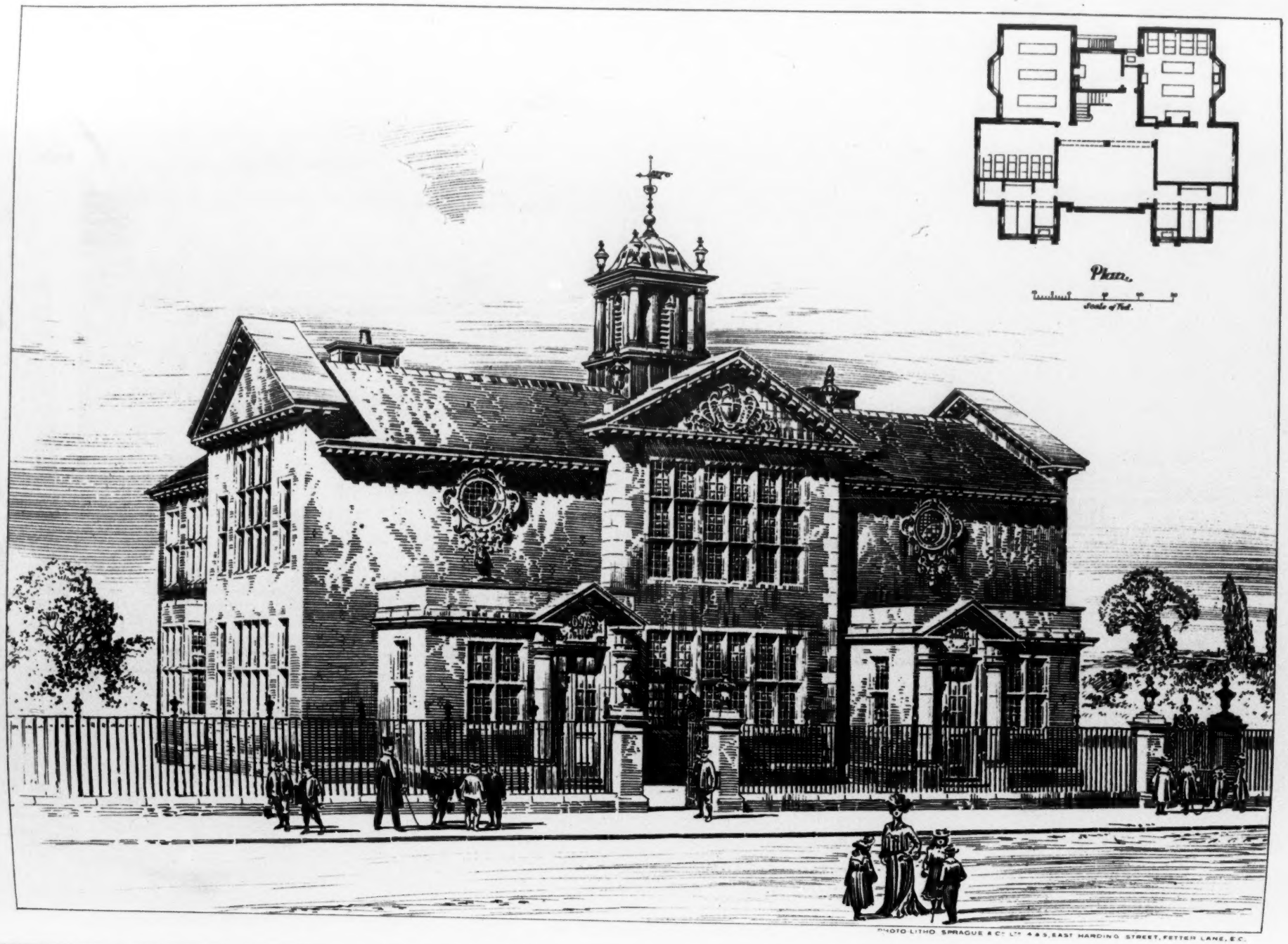


PHOTO-LITHO. SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

URCH, PICCADILLY: PERSPECTIVE VIEW OF THE INTERIOR, LOOKING WEST.
DRAWN BY MR. LESLIE WILKINSON.



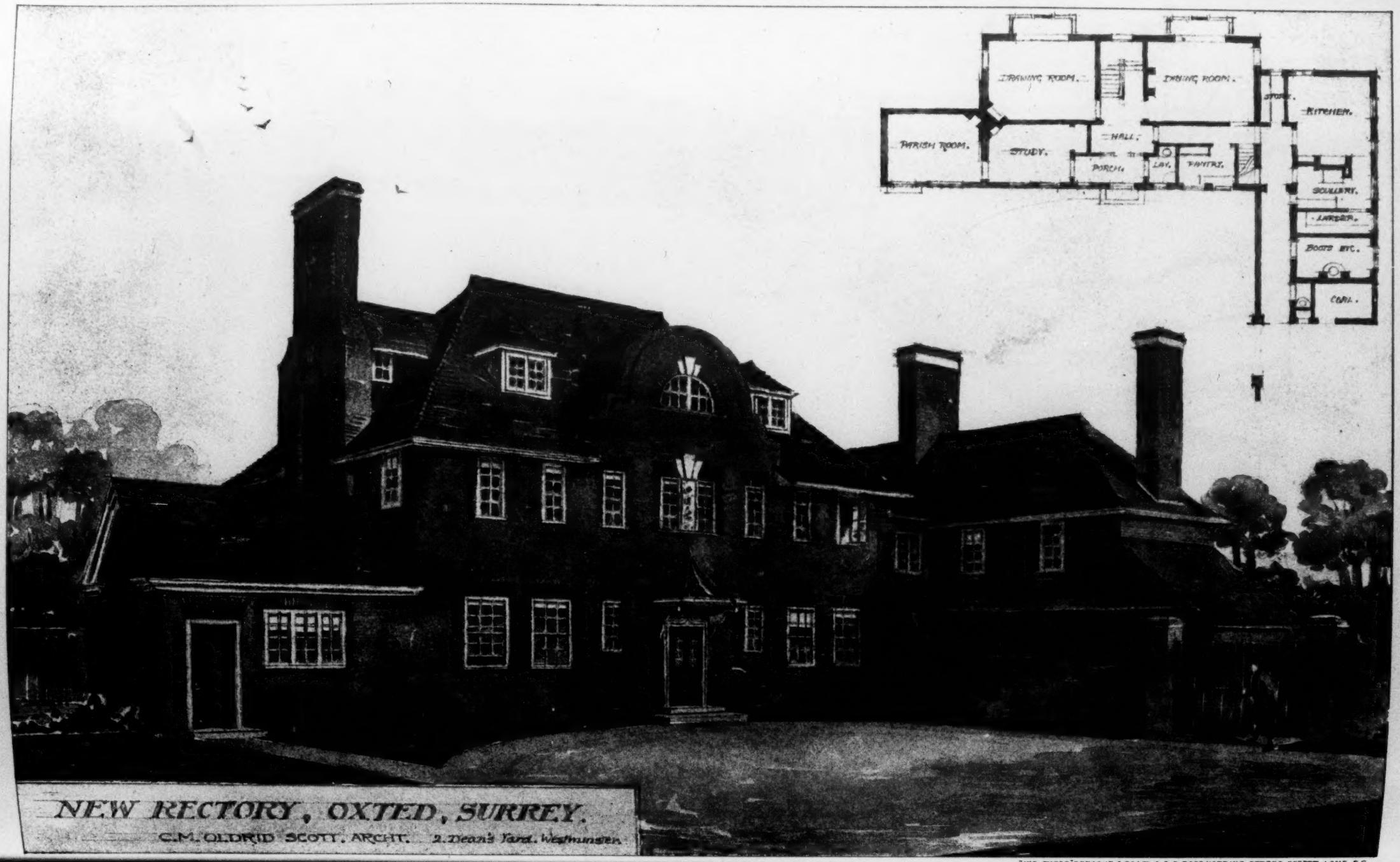
Plan.

Scale of Feet.

PHOTO-LITHO SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

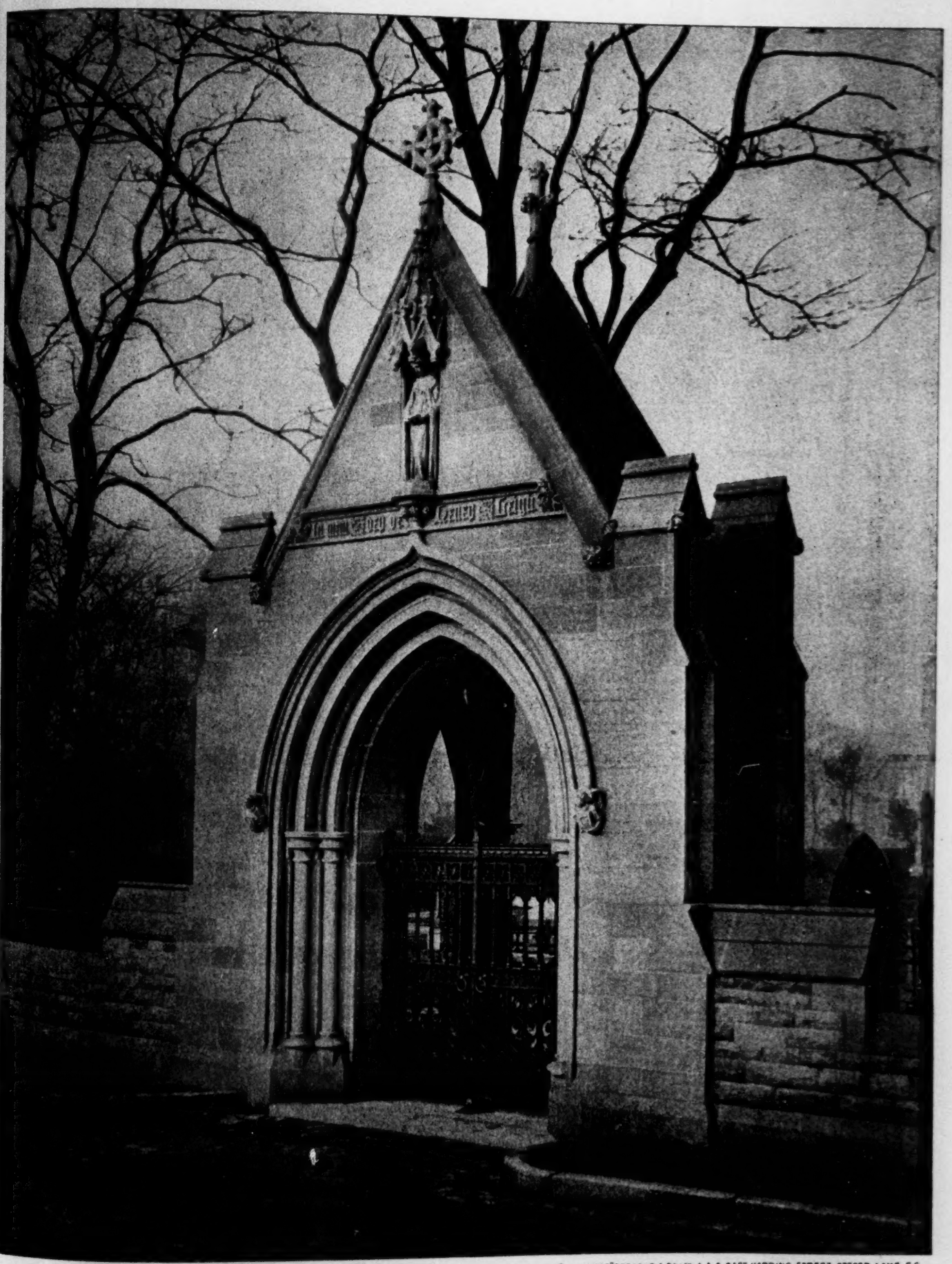
HOLY TRINITY CHURCH, SOUTHPORT.—MESSRS. MATEAR & SIMON, ARCHITECTS.



NEW RECTORY, OXTED, SURREY.

C.M. OLDRID SCOTT. ARCHT. 2. Dean's Yard. Westminster.

"IBA" PHOTO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



"INK-PHOTO" SPRAGUE & Co. LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

MEMORIAL GATE AT MONTON CHURCH, MANCHESTER.

MESSRS. T. WORTHINGTON & SON, ARCHITECTS.

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NEW RECTORY, OXTED, SURREY.

The house is built of local stock bricks of a purply red, with red sand-faced bricks for dressings and quoins. The roof is of local red tiles.

A thick belt of trees shuts out both view and, to a great extent, sun on the south and east sides of the site, which is only one acre in extent, and therefore the dining and drawing-rooms were both given a westerly aspect, where there is a pretty view over Oxted village.

The cost of the house and boundary fences was 3,200*l.*, Messrs. J. Brasier & Son being the contractors, and Mr. C. M. Oldrid Scott the architect.

MEMORIAL GATEWAY, MONTON CHURCH, NEAR MANCHESTER.

The boundary wall and gateway here illustrated were erected as a memorial.

They were executed in Darley Dale stone by Messrs. Deakin & Greenwood; the gates and railings were the work of Messrs. George Wragge, and the statue in the niche is by Mr. John Tweed, A.R.A.

The architects are Messrs. Thomas Worthington & Son, of Manchester, who also designed the church, with the schools and keeper's house.

COMPETITIONS.

Municipal Buildings, Bromley.—The assessor in the competition for Bromley municipal buildings, Mr. J. S. Gibson, has now delivered his award, with the following result, viz.: First, Mr. R. Frank Atkinson, 8, Sackville-street, W.; second, Messrs. H. Ashley & Winton Newman, 10, Gray's Inn-square, W.C.; third, Mr. G. Harrold Norton, 14, Bedford-row, W.C.; fourth, Messrs. Hall & Phillips, 6, Great James-street, Bedford Row, W.C.; fifth, Messrs. Lanchester & Rickards, 1, Vernon-place, Bloomsbury-square, W.C.

BOOKS RECEIVED.

John N. Rhodes—a Yorkshire Painter: 1809-1842. By W. H. Thorp. (Bemrose & Sons.)

Sea Defence Works at Clacton-on Sea.—By their Bill, deposited for the next Parliamentary session, the Clacton-on-Sea Commissioners are seeking power to construct a sea wall in the parish of Great Clacton, with promenades or roadways for foot passengers. The estimated cost of the undertaking is 60,000*l.*

Crystal Palace Engineering School.—The award of certificates was made on Friday last week, at the close of the thirty-second years' work of the Crystal Palace Company's School of Practical Engineering. The chair was occupied by Mr. Charles Hawksley, Past-President of the Institution of Civil Engineers. From the reports of the Examiners, Mr. J. F. J. Reynolds, A.M.Inst.C.E., Mr. C. W. Barnett, A.M.Inst.C.E., and Mr. J. G. W. Aldridge, A.M.Inst.C.E., it appears that the general merit of work in the Mechanical, Civil, and Electrical Sections of the school has been fully maintained. The high percentage of marks—280 out of a possible 296—obtained by Mr. G. O. Sharpe, in the Lecture Examination on "Materials and their Manufacture," is deserving of special mention. Another noteworthy feature is the importance attained by the Electrical Section, whose continued growth testifies to the fact that adequate knowledge of electricity is now an absolute essential to the well-trained engineer. The certificate of honour for six school certificates, none lower than third in order of merit, was secured by Mr. J. M. S. Culbertson, and the "Wilson" premium for a paper read before the Engineering Society on "Railway Practice and Construction in India," was awarded to Mr. L. H. C. Palmer. In the course of his address to the students, Mr. Hawksley expressed his regret that the present generation of engineers neglected the example of their predecessors, who combined utility with æsthetic design. The speaker had been so much struck with the ugliness of modern engineering works that he hoped to establish a premium in connexion with the Institution of Civil Engineers for designs combining good taste with utility and strength.—Other papers read during the session were "Water-boring in South Africa," by Mr. W. D. Cornwell; "Portland Cement," by Mr. N. G. Watson; and "Irrigation in India," by Mr. N. H. J. Daniell. Mr. S. Y. Knight (a former student), of the Llantwit Engineering Company, also read a paper upon "Railway Brakes."

Correspondence.

ARCHITECTS' DRAWINGS.

Sir,—It was with great satisfaction that I read your first article on the case of Ebdy *v.* McGowan which brings up the question of ownership of drawings so forcibly, and I am still more pleased that you are continuing the discussion and are purposing to do something practical to show how important it is to the profession, and indeed to artists similarly situated outside the profession. In response to your appeal, I shall be happy to add a cheque for five guineas to the one so promptly offered by "The Provincial Architect" and hope many others will do the same.

One of my earliest contentions—as a young architect—was on this very point, and I succeeded in proving my case to a large church building committee, advised by a very shrewd solicitor. My drawings were my tools, not to be handed to anyone else to do my work, but to be retained by me for future use if need be, at any rate, for my own purposes. I argued that I was not a *draughtsman* to make pretty drawings, but an *architect* to build buildings, with or without such tools as these drawings, models, or diagrams—according as circumstances required.

Since then (nearly half a century ago!) I have always stuck to the point and always succeeded, having never given up a drawing in my life under compulsion, and have found the use of my old drawings frequently—my clients often being glad to find I could produce what they themselves would have been sure to have lost, in the case of alterations, enlargements, drainage works, etc. I have always been glad to give drawings or copies which might be of use or importance, but never if demanded as a right, unless specially paid for.

C. F. Hayward.

Sir,—If the report of the case of Gibbon *v.* Pease, your clear exposition and criticism of the facts, and your powerful appeal to architects as a body are insufficient to disturb the lethargic, selfish isolation into which it is the habit of architects, whether as units or as corporate bodies, to plunge themselves, I do not flatter myself that anything I could say would be usefully supplementary.

Nevertheless, I may perhaps offer the following points for consideration:—

(1) To contest successfully the very important question of the ownership of architects' drawings and to bring out clearly all the factors in the case require not only plenty of "the sinews of war," but, what is almost equally necessary, the evidence of "custom" as demonstrated by the pronounced and unmistakable anxiety of architects, individually and collectively, lest they should be deprived of the benefit and protection of such "custom." Consequently, I should like to see many far greater sums than my own 5*l.* 5*s.*, and also many lesser amounts, subscribed to the fund you are good enough to open, so that it may be made quite apparent that from the man who can only afford 5*s.* to the one who would not miss 100*l.* the unanimous spirit and intention of architects is to preserve their rights and "custom" in this matter, whether by the law as it may, on appeal to the highest courts, be held to stand, or by the law as it may require to be amended so that justice and law may be, as regards architects, synonymous expressions. And it should be borne in mind that apparently even the measured drawings and sketches of student-days could be demanded by a client, under such an iniquitous *original claim* as that of Gibbon *v.* Pease, had the knowledge so gained been applied to the preparation of the drawings of a client's building.

(2) Architects as units (and as corporate bodies through their various societies) have, in the case of Gibbon *v.* Pease, an opportunity of obtaining an important legal decision, at a cost of a few pounds each, which would cost them many hundreds of pounds to strive to obtain individually, with probably, as merely an individual's action, less satisfactory results. And, further, the value of even one set of drawings, which under the decision in Gibbon *v.* Pease had to be surrendered, would be far in excess of the cost to each architect of the collective appeal against it which is proposed to be taken.

(3) Had action similar to that now contemplated in the case of Gibbon *v.* Pease been taken in the case of Ebdy *v.* McGowan, a great deal of subsequent hardship to architects, which has been held justified under that decision of the law courts, would have been avoided, and probably the case of Gibbon *v.* Pease would never have arisen, and, had such a case arisen as Gibbon *v.* Pease, the difficulties of obtaining a reversal of the present decision in that case would not have been increased by the need of explaining away what will certainly be considered by lawyers an awkward "precedent," however much it may be repudiated by architects as being totally inapplicable to the case under review.

(4) Similarly, if means are not taken to reverse the present decision in Gibbon *v.* Pease, the next thing will probably be that clients ignorant of what architects really ought to be and of what architecture (worthy of the name) actually is will be led to suppose that every portion of a piece of architecture has been or should have been made the subject of elaborate sealed and full-sized drawings and of legally-phrased specifications and contract forms, and the next lawsuit to be anticipated by architects would probably be one for "negligence" or "legal fraud," because, perchance, some architect could not produce to his client on demand elaborate and painfully mechanical drawings and written descriptions of every moulding or scrap of carving connected with some building, or because some client with a taste for microscopical investigation had been able to detect that in execution of the work a departure from "studio designing" had been found by the architect to be more architecturally pleasing or desirable.

In fact, it only requires a very small expenditure of mental reflection for every architect to realise how very serious are the issues raised by the case of Gibbon *v.* Pease—for himself selfishly, and unselfishly for architecture, and to be fully convinced that it is in the interest of every single architect in England (in other countries, happily for them, the need does not exist, for in them architecture is better appraised at its true value) to prevent the abrogation of the "time-honoured custom" regarding the ownership by architects of their drawings and specifications.

(5) Lawyers delight in precedents. When, therefore, any one of them makes such absurd remarks as those respecting sculptors and sculpture to which you referred in your leading article of the 26th ult., he may perhaps be well referred to the practice which prevails in the more commercial world of gun-makers, engineers, and ship-builders. Let him inquire whether the purchaser of a piece of ordnance obtains with it all the experimental and completed drawings and specifications, all the calculations, particulars, and tests, and all the patterns, foundry-plant, and tools as well; or let him ask himself whether such firms as that of Armstrong or of Krupp would have even come into existence had every purchaser of a new form of gun been able to claim as part of the bargain and without payment the brains which, had the purchaser himself possessed them, would have rendered an Armstrong or a Krupp a superfluity. Let him also make similar inquiries amongst engineers and ship-builders, and say whether the results of such investigation were not similar. And then, whether he looks upon the practice of architecture as "an art or a profession," and whether or not the "registration of architects" (as of solicitors) be the one thing needed to establish the right of architects to treatment as fair as that which more "commercial" workers receive, it will not be difficult for him to gather quite a *posse* of precedents in support of that view of an architect's position, of his responsibilities to his client, and of his own rights and privileges which every architect has hitherto supposed to be so clear and obvious that even a lawyer, befogged as he may be by "case-law" and "precedent," ought not to fail to appreciate and to concede.

I beg to thank you as one architect for kindly undertaking to receive subscriptions towards the cost of the appeal, on behalf of architects generally, against the present decision in the case of Gibbon *v.* Pease, and to enclose my promised cheque for 5*l.* 5*s.* Should further monies be needed to carry the appeal to the highest courts or otherwise, I shall hope to be able then to make a further subscription, and I can only hope that, as in the case of Colls *v.* Home & Colonial Stores, Limited, a similar exhibition of courage and determination in the case of Gibbon *v.* Pease may effect as much needed a change in the legal estimation of architects and architecture as has taken place regarding the less human, though at one

time apparently more hopeless, subject of "ancient lights."

A PROVINCIAL ARCHITECT.

SIR,—After the extremely energetic manner in which you have taken up the subject of the ownership of architects' drawings, I am very glad to find that you are further assisting matters by kindly offering to receive subscriptions towards the cost of an appeal.

Mr. Chorlton James, of the firm of Messrs. James & Morgan, of Cardiff, has very generously forwarded to me a cheque for 5*l.* 5s. towards the cost of this appeal, and I have forwarded this to the solicitors who have charge of the case.

This public spirited action on the part of Messrs. James & Morgan will, I hope, induce others in the provinces to also assist towards the necessary expenses.

The action which Mr. Pease is proposing to fight is of so much importance to the whole profession that every architect ought to make a point of sending a contribution, as undoubtedly the great cost should not bear unduly on the shoulders of any one individual when the case is being fought to maintain a principle.

The arguments you have brought forward both in the *Builder* and elsewhere have been so convincing that very little remains to be said.

To my mind architects above all others should know what it is they are selling when they receive their fees for professional assistance.

It seems almost as reasonable for an employer to insist upon having the plans—which are in fact the architect's working tools—as it would be for a customer to insist upon having the tailor's brown-paper patterns from which he cuts his cloth in making a suit of clothes.

I have much pleasure in herewith handing to you my cheque for 10*l.* 10s. towards the cost of the appeal. GEORGE HUBBARD.

THE JOINERY TRADE.

SIR,—It would be interesting to know if "A London Builder" has tried to turn out work at the price and in such quantities as "A Shop Foreman" mentions. "A Shop Foreman," however, must not be too sure that the foreigner will raise the price of deals, etc., should joinery be taxed. The price of every article of commerce is regulated to a great extent by the supply and the demand, and, after getting as much as he can on "forward contracts," the foreigner consigns large quantities of timber to our London auction rooms to fetch what it will. On the other hand, should "A London Builder" get his 10 per cent. tax, he may find it hardly worth the candle. By the time the (say) doors are valued as low as possible for taxation, and numerous little dodges resorted to for the purpose of evading the same, it will probably work out at about 6d. or 9d. per door, a difference which can easily be made in the manufacture at home. "A London Builder" claims a "modern plant of machinery," but it can hardly be well managed, if his buying and joinery shops are. While a joiner is placed in charge of every joiner's shop in the country, anyone is considered competent to take charge of the machine work, instead of an experienced machine hand, and yet good results are expected. I know places where it costs more to grind a saw than it would do to buy a new one, and they are often in hand too, yet the person in charge would be the first to point out his splendid system. This is only one point; but how can we expect to compete with foreigners on these lines? Wages and taxation are always to the front. Good management and enterprise seem to be secondary considerations. There are plenty of competent men to be found, some prepared to purchase an interest in a substantial firm, but—opportunity is a fine thing. I hope this discussion will be continued for our mutual benefit. MILL FOREMAN.

NEW WESLEYAN METHODIST HALL COMPETITION.

SIR,—We have this week learned that the correct address of the last-named firm in the list of successful competitors published in your last issue is "Messrs. C. E. Mallows & A. W. S. Cross, London." ALBERT CLAYTON.

*** The mistake of course was not ours. The names were sent to us, type-written, and we could only give them as sent.—ED.

The Student's Column.

ASPHALT: ITS COMPOSITION AND PROPERTIES.—III.

ASPHALT MASTIC.

THE sample of bahrein asphalt rock referred to in our last chapter contains in its natural condition too much bitumen for "compressed asphalt," but approximately correct for "mastic," which is, however, usually made by boiling together rock asphalt containing about 10 per cent. of bitumen with a proportion of refined bitumen of suitable quality. After being thus heated to 400 deg. Fahr. and mixed mechanically in a boiler it is run into blocks of about ½ cwt. It should contain 15 per cent. of total bitumen, be thoroughly homogeneous after stirring, and, unlike asphalt rock, should not fall to pieces on being heated. To obtain this homogeneity the rock must be ground very fine, the mixture with the bitumen amalgamated by fusion, or "cooking," in a thorough manner. For roadways it is usually laid in two thin layers, of a total thickness of 1 in., whereas the compressed kind is usually 2¼ in. For footpaths, where the wear is not so great, grit (hard and clean) is added, 33 per cent. for temperate and 50 per cent. for tropical countries.

It is air, water, and vermin proof, is elastic to the tread, absorbs vibration, and is a non-conductor of electricity. It is unaffected by heat or cold—that is, the expansion and contraction which are caused by change of temperature do not produce cracks in the material. These properties make it very suitable for a damp-proof course because of its accommodation to any settlement of the building without break in the continuity of the protection, and because it need not be so thick as to squeeze out under the pressure of the superincumbent mass. Ordinary asphalt or mastic is not capable of resisting acids, because of the immediate effect of the latter upon the limestone contained as the base, but by mixing bitumen with pure silex an acid-resisting mastic may be made and applied like ordinary mastic. This kind is used for electric accumulator rooms and baths for electrolysis, etc. Reference to the effect of petroleum spilt upon asphalt and of gas leaking under asphalt roadways will be made after more detailed reference has been made to the components of the "total bitumen" of Trinidad pitch and other bituminous substances.

Whilst the governing factor in asphalts (compressed or mastic) is the bituminous portion, yet the condition or size of the grains of the base (limestone) is not without effect. In Seyssel, Val de Travers, and Servas rocks the grain is fine, whilst in the Sicilian it is coarse, so that the specific gravity of the latter rock is less than that of the former.

Liquid asphalt, or asphalt mastic, footpaths of a ½ in. layer weigh 80 lb. per sq. yd., equal to 143 lb. per cubic ft.

The use of bitumen is not confined to admixture with asphalt rock for the production of "mastic," but is used on its own account for watertight linings, for electric insulation, and the composition most suited for these several purposes must now be considered.

BITUMEN.

The several varieties of this substance are determined mainly by the proportions of the percentages of the more volatile constituents, but also in a less degree by the sulphur content. In this latter respect the nearly pure bitumen of Barbados is superior to that of Trinidad, being almost free from sulphur, whilst as much as 8 per cent. has been found in some samples from the last-named island. In both cases it is called manjak, and sometimes glance pitch, and is in appearance very much like Cannel coal, having a conchoidal fracture and being possessed of low elasticity. This makes it of service for use in making black varnish or for electrical insulation, but not for purposes where elasticity is of prime importance.

G. du Bois made a test of the best quality of Barbados manjak, and found 95·5 per cent. to be soluble in benzene, which is almost equal to carbon bisulphide as a solvent. Of the soluble matter, 63·63 per cent. was volatile on distillation and 32·27 per cent. of coke was left, whilst 4·10 per cent. consisted of impurities and earthy matters. Of the volatile constituents, 40 per cent. formed a good oil, suitable for the production of petroleum.

This purity in sulphur and ash makes the Barbados manjak valuable for coatings to prevent rusting of iron, or for varnish made by dissolving in turpentine, and is accordingly largely employed in the United States for the manufacture of Brunswick black and as an insulating material for electric cables; but for purposes where elasticity is needed it is by itself unsuitable, and where it is required to mix with natural rock asphalt its high melting-point is against it.

A sample recently tested at the Imperial Institute laboratory having the following percentage composition: Carbon, 81·18 per cent.; hydrogen, 8·43 per cent.; and oxygen, 10·39 per cent., melted at 327 deg. Fahr., whilst a sample of Trinided manjak melted only at 428 deg. Fahr., because it contained only 12·6 per cent. of "petrolene."

TABLE II.

No. of Specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Class of Material.	Natural Bitumens.			Natural Rock Asphalts.					—	Artificial Asphalts.		Old Asphaltic Pavements.		
Description.	Crude Trinidad.	Cuban.	Egyptian, imported from the Dead Sea.	Val de Travers.	Seyssel.	Turrellite, from Uvalde county, Texas.	Kentucky.	California Sandstone.	Grahamite, from West Virginia.	Petroleum residue from Santa Paula.		From Buffalo.	From New York Harbour.	Dubb's Artificial Asphalt.
										Hard.	Soft.			
Water	2·03	0·39	—	—	—	—	—	0·33	—	—	—	—	0·43	—
Petrolene	32·45	25·46	35·09	8·52	7·49	8·79	3·35	11·32	49·96	64·57	63·50	4·39	6·67	66·79
Asphaltene	22·11	54·41	63·18	3·92	4·32	3·27	2·42	3·81	50·04	21·25	29·97	2·83	1·87	31·93
Other organic matter	8·12	2·47	1·73	25·79	—	—	—	1·12	—	13·71	6·09	4·10	3·70	1·28
Mineral matter	35·29	17·03	—	61·76	88·20	87·95	94·23	83·41	—	0·36	—	88·65	87·33	—
Total	100·00	99·76	100·0	99·99	100·01	100·01	100·0	99·99	100·0	99·89	99·56	99·97	100·0	100·0

NOTES.—Nos. 4 and 5 compared with Nos. 1 and 5 of Table I. show higher percentages of bitumen (total).
No. 6. A deposit consisting of a mass of sea-shells cemented by bitumen.
No. 9. A so-called asphaltum taken from a vein in Ritchie county.
Nos. 10 and 11. Hard and soft artificial asphalts; petroleum distillation residues, California.
No. 12. From Franklin-avenue, Buffalo, N.Y. It was laid in 1878, in use for fifteen years. Made of Trinidad asphalt, wax tailings, and sand.
No. 13. From Governor's Island, age not known, but disintegrated by age.
No. 14. Made by adding sulphur to hot Lima petroleum tar.

For purposes where "accommodation" is an essential, as in water-tight linings, and where incorporation with natural asphalt requires an approximately similar melting-point, it is therefore necessary to have recourse to "Trinidad pitch" as the less oxidised and more tractable component.

Trinidad pitch is known also as "asphalt" and as "lake asphalt," from the extinct crater (in appearance like a lake), where the purest form is obtained; and this is sub-divided into liquid asphalt, semi-liquid asphalt, and solid asphalt, according to the consistency, which in turn is determined by the percentage composition of its petroleum-like components. The quality is also affected by the percentage of earthy matter that has gained admixture with the asphalt, and is greatest in "land asphalt," which is mined outside the crater referred to.

We have already mentioned the fact that means have been devised for differentiating the substances usually grouped under the term "bitumen," this having been found necessary in view of the great variety of natural rocks, natural pitches, and the introduction of petroleum and gas-tar pitches, or other analogous substances as substitutes.

Unfortunately no one method has as yet been found sufficient to ascertain these facts, and we have therefore to examine those most generally accepted for each feature, leaving out of our notice others which differ in details only.

The method devised by Peckham and Lynton is based upon a separation that originated with Boussingault, who found that bitumens yield to certain solvents a portion of their constituents to which he gave the name of "Petrolene," and to certain other solvents another portion which he called "Asphaltene." The first step in the process is to separate and estimate the water and then to digest the substance with petroleum spirit (sometimes called petroleum ether). The percentage weight of material removed by this solvent is called "Petrolene." To what remains undissolved boiling spirits of turpentine are added, and the digestion is continued for several hours, or as long as any coloured matter continues to be extracted. After this the process is repeated with chloroform in the place of turpentine, after which the matter still remaining insoluble is ignited and the residue weighed (with proper precautions) to determine the amount of organic matter and mineral matter respectively.

The table No. II. is given to act as a connecting link with Table I., and to show the components of West Indian and American products. The first section of Table III. has been compiled from the results obtained by S. F. Peckham, and recorded in the *American Journal of Science*, Vol. I., fourth series, the first six items by the officials of the Imperial Institute for the purpose of showing the varieties that exist in the district of La Brea. The value of the differential method has been confirmed by Mr. Clifford Richardson, who has made many tests of material and inspected the sites where the samples were taken, and his summary of Mr. Peckham's returns is also embodied in the third portion of the table.

He says: "These analyses, although carried out on somewhat different lines from mine, permit of the same conclusions in regard to the changes which have taken place in the land samples; and the additional determinations of bitumen made by Professor Peckham with chloroform furnish some additional and conclusive evidence of the differences between the two kinds of material.

"These show that the average 'land' specimen contains 2·4 per cent. more of its bitumen in the form soluble only with difficulty, while iron pitch, which is acknowledged to be of no value for paving purposes and is always rejected in digging land pitch, has 7·3 per cent. more of its bitumen in this form."

From this we can draw the inference that the land pitch collected by Professor Peckham is one-third converted into iron pitch and of so much less value than lake pitch for paving purposes. In fact, his results are as conclusive evidence of the difference between lake and land pitch as any that have been offered, and confirm the results of experience with the asphalt from the land deposits in the laying of street pavements."

The essential features of the investigations just referred to are embodied in sections 1 and 3 of Table III., and those of E. Donath and B. M. Margosches by a somewhat similar method in sections 2 and 4 of Table III.

Instead of using boiling spirits of turpentine and chloroform after petroleum spirit, the last-named gentlemen employ benzene and carbon bisulphide. Notwithstanding this, the independent investigations prove quite confirmatory. They show that the bitumens in refined Trinidad pitch are practically identical with those of the standard rock asphalts, viz., that the "petrolene" is twice the percentage of "asphaltene," say 66 per cent. of the former, 33 per cent. of the latter, with about 1 per cent. extractable by the most searching solvents chloroform or bisulphide of carbon.

The table shows also the great improvement that takes place in the refining of the Trinidad pitch, mainly by removing the portion which is difficult to dissolve, viz., the chloroform, and incidentally shows that there is more of the improvement to be effected in the case of land pitch than in lake pitch.

The figures show also how much nearer the petroleum pitch is to the natural bitumen than is coal tar pitch. This is not difficult to understand, seeing that the former is akin in origin and mode of formation and in the temperature of its distillation, whilst the latter is a product of high-temperature distillation in which a different order of carbon compounds, viz., the aromatic, is produced. The presence of these last named, such as anthracene, furnish a means for detecting the presence of coal-tar pitch.

The resemblance between petroleum pitch and Trinidad pitch is also in the percentage of organic matter undissolved, and means of differentiation of the components of this will be hereinafter mentioned. There is a difference in the mineral matter or inorganic residue in the separated bitumens, but as supplied commercially mixed with a base; this does not

TABLE III.—SECTION 1.

Specimen No.	Trinidad Pitches Tested by the Extracts.	Soluble in Petroleum Spirit.	Soluble in Boiling Spirits of Turpentine.	Soluble in Chloroform.	Total called Asphaltene.	Total Bitumens.	Organic Matter Insoluble in Chloroform.	Inorganic Material	Grand Total.
	Peckham's Method	A	B	C	B+C	A+B+C			
1	Lake pitch north-east	36·499	13·411	4·025	17·436	53·935	10·371	35·675	99·981
2	" " centre	35·950	12·310	5·762	18·072	54 025	10·782	35·192	99·999
3	" " west	34·200	11·575	7·222	18·797	52·997	11·357	35·645	99·999
4	" " south-east	35·362	9·862	4·800	14·662	50·024	11·212	38·762	99·998
5	Land pitch near lake	33·733	13 09	5·65	18·74	42·473	11·19	36 307	99·970
6	" " " village	33·619	10 69	7·235	17·925	51·544	11·618	36 832	99·994
7	Refined pitch	39 340	19·270	0·713	19·983	59·250	8·507	32·243	100·00
8	" "	38·485	21·705	1·133	22·838	61·323	7·460	31·217	100·0

SUNDRY ARTIFICIAL PITCHES TESTED BY THE EXTRACTS. E. DONATH'S METHOD. (SECTION 2.)

—	—	Petroleum Spirit.	Benzene.	Carbon Bisulphide.	—	—	Insoluble in Carbon Bisulphide.	—	—
9	Sicilian asphalt	7 80	3·70	0·30	4·00	11·80	—	88·20	100·0
	Bitumen from ditto	66·10	31·36	2·54	33·90	100·00	—	—	100·0
10	Petroleum pitch (soft)	68·50	28·50	1·50	30·00	98·50	1·50	—	100·0
11	" " (hard)	59·50	27·00	4·50	31·50	90·50	9·00 ?	—	99·50
12	Lignite tar pitch (soft)	81·30	15 50	0·70	16·20	97·50	2·60 ?	—	100·10
13	" " " (hard)	11·90	86·50	0·30	86·80	98·70	1·80 ?	—	100·50
14	Coal tar pitch (soft)	25·05	44·98	6·57	51·55	76·60	22·67	0·15	99·42
15	" " " (medium)	15·14	40·03	7·10	47·13	62·27	37·81	0·25	100·33
16	" " " (hard)	15·51	39·86	15·21	55·07	70 58	29·19	0·20	99·77

SUMMARY SHOWING EXTRACTS AS ABOVE, AND THEIR PERCENTAGE OF THE TOTAL BITUMENS A+B+C.—(SECTION 3.)

	Varieties of Trinidad Pitch compared with Sicilian Asphalt.	Percentage of Original Material.					Percentage of Bitumens.			
		A	B	C	B+C	A+B+C	A	B	A+B	C
17	Crude lake pitch average	35·2	12·4	5·2	17·6	52 8	66·8	23·3	90·1	9·9
18	" land " "	33·3	11·9	6·5	18·4	51·7	64·7	23·0	87·7	12·3
19	" iron "	33·6	13·8	9·9	23·7	57·2	58·7	24 1	82·8	17·2
7	Refined pitch	39·34	19·27	0·713	19·983	59·25	66·41	32·42	98·83	1·17
8	"	38·485	21·705	1·133	22·838	61·323	62·74	35·39	98·14	1·86
9	Sicilian asphalt	(See above).		—	—	—	66·10	31·36	97·46	2·54

TABLE III.—SECTION 4.

Specimen No.	Soluble matter in Percentages of the Total Bitumen. Substance Tested.	Dissolved by Petrol Spirit.	Boiling Spirits of Turpentine.	Sum of the two Extracts	By Chloroform.	Authority.	Ratio of the Extracts to each other.		
		A	B	A+B	C		A÷B	A÷C	A÷B+C
7 & 8	Refined Trinidad (average)	64·57	33·91	98·48	1·52	Peckh'm	1·90	42·4	1·82
9	Sicilian Asphalt	66·10	31 36	97·46	2·54	Donath	2·11	26·0	1·95
10	Petroleum Pitch (soft)	69·54	28·93	98·47	1·53	"	2·40	45·68	2·28
11	" (hard)	65·19	29·84	95·03	4·97	"	2·19	13·1	1·87
12	Lignite Tar Pitch (soft)	83·38	15·90	99·28	0·72	"	5·25	116·1	5·02
13	" (hard)	12·00	87·63	99·69	0·31	"	0·13	39·67	0·13
14	Coal Tar Pitch (soft)	32·70	58·72	91·42	8·57	"	0·56	3·81	0·49
15	" " " (medium)	24·32	64·29	88·60	11·40	"	0·38	2·13	0·32
16	" " " (hard)	21·98	56·48	78·46	21·54	"	0·40	1·02	0·28

afford a reliable method of discrimination. On account of these difficulties the extracts have been further examined by Dr. G. Lunge and V. Krepelka, whose recent researches are embodied in Table IV.

Before considering those results, it will be well to give the conclusions which Mr. E. Donath and Mr. Margosches have reached. After referring to the manner in which individual products may be distinguished by dry distillation, viz., wood-tar pitch, coal-tar pitch, lignite tar, petroleum, stearine, wool-tar pitches, and asphaltum, they go on to say that "natural asphaltum, when treated with alcoholic potash, colours the liquid only slightly at first, but more intensely after some time; lignite tar pitch colours the liquid immediately, and petroleum pitch gives either no coloration or an extremely weak one. The behaviour on successive extractions with petroleum spirit, benzene, and carbon bisulphide also affords a means of distinguishing between lignite tar pitch, petroleum pitch, and asphaltum. In the case of the last named, the insoluble residue consists entirely of inorganic mineral matter. In practice the most common form of adulteration is the addition of coal-tar pitch to natural asphaltum."

They recommend successive extraction as just mentioned, and if coal-tar pitch be present the residue will be black and will give a brownish red solution with concentrated nitric acid. The presence of anthracene and the production of a coloured fluorescent solution with methyl or ethyl alcohol or chloroform yield additional evidence of the presence of coal-tar pitch." Dr. Lunge states that petroleum spirit will give a precipitate with the chloroform solution of the tar pitches, but not with those of the natural asphaltums or petroleum asphalts.

"STUDENT'S COLUMN" PAPERS ON PORTLAND CEMENT.

WE are deeply annoyed, for every reason, to have had evidence laid before us that the writer of the articles headed "Notes on Portland Cement," which appeared under the heading of "Student's Column" in the earlier pages of the present volume, has made a use of Mr. D. B. Butler's book on "Portland Cement" (published by Messrs. Spon) in a manner which constitutes an infringement of copyright; as we find that many sentences have been transferred almost *verbatim* from Mr. Butler's book to our columns. Both author and publisher need hardly be told that we regret this, since it is in fact an even greater injury to us than to them. The writer of the articles, who was previously unknown to us, gave us what appeared to be satisfactory evidence as to his capability to deal with the subject, and we accepted his articles in good faith. He had never contributed to our columns before, and we need not say that he never will again.

OBITUARY.

SIR LOWTHIAN BELL.—By the death of Sir Isaac Lowthian Bell, at the age of nearly 89 years, the world has lost one more of the few remaining veterans who helped to build up the great engineering industries of Great Britain, and one who had acquired a world-wide reputation as a scientific and practical metallurgist. Born at Newcastle in February, 1816, Sir Lowthian Bell has for many years been one of the eminent men whom Tynesiders delight to honour, and, although his more important work was performed on the banks of another river, he never forgot the city of his birth. After attending Mr. Bruce's school in Newcastle, he went to Germany and Denmark for further instruction, thereafter becoming a student at Edinburgh University, and the Sorbonne, Paris, and finally, at the age of 24, he joined the ironworks at Walker-on-Tyne, of which his father was part proprietor. In 1845, Mr. Bell succeeded to a portion of his father's interest, and at that date the firm were already smelting ironstone from the Yorkshire coast in a furnace designed by him for the purpose. The discovery of the Cleveland ironstone, at Eston, a place further inland, came as no surprise, and, about the year 1850, Mr. Bell and his two brothers at once threw themselves into the new enterprise suggested, and built the now celebrated ironworks at Port Clarence, on a site that was then a mere salt marsh on the north bank of the Tees. At about the same period Mr. Bell was also connected with the chemical works at Washington, North Durham, in association with Mr. H. L. Pattinson, F.R.S. He enlarged these works very considerably, and installed extensive plant for the manufacture of oxychloride of lead, as well as one of the first plants in England for the production of aluminium by the Deville process. We cannot here attempt to trace the progress of the Clarence Ironworks, but one or two points may be mentioned for the purpose of indicating the capable methods characterising the subject of this memoir. The new venture, starting with three furnaces in 1854, soon had to face severe industrial depression, and the hostility of the Stockton and Darlington Railway. After a Parliamentary struggle Messrs. Bell Brothers succeeded in obtaining independent access to their mineral rights by the formation of the Cleveland Railway Company. Further sources of ore having been secured for insuring ample future supplies, the firm was instrumental in obtaining powers for an extension of the line to Loftus. Attention was next turned to the question of fuel, and three collieries were successively acquired. In the meantime the number of furnaces had been increased from three to six, and in 1865, after an exhaustive examination into the theory of the combustion of fuel in the blast furnace, Mr. Bell satisfied himself as to the desirability of larger furnaces, and built two with a height of 80 ft., and a diameter of 16 ft. Step by step the old furnaces were replaced by others of the new type, and four additional furnaces were erected, raising the number to twelve, the output per furnace being raised from 150 tons to over 900 tons per week. Mr. Bell was one of the first to recognise the advantages to be derived from the utilisation of furnace gases for heating the air blast, and, in fact, he played an important part in connexion with all the improved metallurgical processes which were introduced in those days. At a later date, as Sir Lowthian Bell, he conducted a series of experiments, at a cost of between 30,000*l.* and 40,000*l.*, which demonstrated the possibility of producing steel on a commercial basis from Cleveland iron. This development had the important effect of rendering unnecessary the importation of Spanish ores for steel making, and opened up new fields for the application of Middlesbrough steel. Besides being a far-seeing and competent business man and an expert metallurgist, Sir Lowthian was a scientific and practical chemist, and an able statistician. Moreover, he was always a student and an investigator, and ever ready to communicate the results of his researches for the benefit of the world. Many of his writings have been translated into French and German, and are justly regarded as classic works. To enumerate the papers he has contributed to various scientific societies would involve a lengthy catalogue. Some of them have been published in book form under the title, "The Chemical Phenomena of Iron Smelting," and another well-known work of his is a book on the "Principles of Iron and Steel Manufacture." In 1858, Sir Lowthian (then Mr.) Bell was elected a member of the Institution of Mechanical Engineers, of which he became President in 1884; in 1867 he joined the Institution of Civil Engineers as an associate, being transferred to the class of members in 1873. He was one of the original founders of the Iron and Steel Institute, formed in 1869, and occupied the position of President from 1873 to 1875. In 1874 he became a fellow of the Royal Society, and he was elected an honorary member of the American Philosophical Society. He was also a member of the Chemical Society, and received the first Bessemer gold medal, as well as George Stevenson, Howard, Telford, and other medals and awards in the course of his professional career. He was created a baronet in 1885, and received the degree of LL.D. in 1893 from Edinburgh University. Sir Lowthian Bell was twice Mayor of Newcastle, and was also a justice of the peace, deputy-lieutenant, and sheriff for the County of Durham, and for five years member of Parliament for Hartlepool.

MR. W. PROSSER.—The death took place, on the 12th inst., at Wandsworth Common, S.W., of Mr. William Prosser, for over twenty years clerk of works under Sir Geo. Gilbert Scott, and afterwards with Messrs. Ernest George & Peto, in connexion with Rousdon, Devonshire. Mr. Prosser had retired from work for the past thirteen years, and reached the advanced age of eighty years.

DEMOLITION OF A PORTSEA CHURCH.—Under the powers sought for in the Naval Works (Portsmouth Barracks Site) Bill, the site of Holy Trinity Church, Portsea, and of the vicarage house will be transferred to the Admiralty, who contemplate demolishing the church and vicarage and utilising the site for the erection of barracks. The ecclesiastical parish will be united with one or more contiguous parishes.

GENERAL BUILDING NEWS.

BIBLE CHRISTIAN CHURCH, HOVE.—A new Bible Christian church is being erected in Old Shoreham-road, Hove. The church, when completed, will measure 160 ft. by about 68 ft., and will have frontages to Old Shoreham-road, Montefiore-road, and to a new road which it is intended to construct. The church will seat 412 on the ground floor, including a choir of forty-two; provision will also be made for an end gallery to be added when the need arises. The plan of the church shows a nave with shallow transepts, chancel, and organ chamber, entrance vestibules, and a minister's vestry. There will also be a lecture hall to seat about 250, and beneath the lecture hall there will be eight classrooms, three of which will readily form into one room. A ladies' cloakroom and a kitchen are included in the scheme, and the building will be heated by the low-pressure hot-water system. The walls will be faced on the exterior with rubble flint work, with dressings of Bath stone and buff-coloured bricks, and the roofs will be covered with Broseley tiles. The windows are to be glazed mostly with tinted glass in lead quarries. The architect is Mr. Edwin J. Hamilton, of Brighton, and the builders are Messrs. Hockley & Co., of Grantham and Brighton.

CONGREGATIONAL CHURCH, SANDGATE.—The foundation-stone has just been laid of the new Congregational church, Sandgate. The church is designed in the Gothic style, and is to be built of Kentish rag stone, with Wallis' patent stone dressings. The roof will be of open pitch-pine, fitted with Messrs. Shorland's patent extract ventilator, and both church and schoolroom will be fitted with ventilating panels. The windows of the church are two-light, with circular light over, filled in with tinted leaded lights, and at the east end there will be a four-light tracery window. The flooring of the church, vestry, and schoolroom will be wood blocks, laid by the Westminster Flooring Company. The seating accommodation of the church will be 250, and the schoolroom, situated at the rear of the church, will hold seventy-five scholars. The building throughout will be heated by Messrs. Werner, Pfleiderer, & Perkins' small bore system of heating. The contractor for the work is Mr. J. Brissenden, of Sandgate, and the architects are Messrs. Bowles & Hawkins, Dover.

CHURCH, STOCKTON.—The Bishop of Durham presided at a meeting, held at Stockton on the 12th inst., at which an appeal was made for funds towards the extension of Holy Trinity Church, Stockton. It was explained that the extension of the chancel, for which the design of Mr. C. Errington, Newcastle, had been accepted, would cost about 1,400*l.*, and the entire scheme nearly 3,000*l.*

NEWINGTON CHURCH, SITTINGBOURNE.—The new work in connexion with the restoration of the fabric of this church was dedicated on the 16th inst. The church is a structure of various dates, the earliest part being the present vestry, which was built apparently as the lower part of a tower by Richard de Lucy, Lord Chancellor of England, between the years 1154 and 1178, in the reign of King Henry II. The stonework of the two lancet windows in this chamber was quite decayed, and has been replaced by new, and a new vestry doorway with oak door has been inserted. The other work consists of rebuilding the defective parts of buttresses and renewing such portions of the stonework of windows, string courses, etc., as were in an advanced state of decay, and restoring the west gable of the south aisle, which has been patched with modern brickwork. The whole of the work has been carried out by Mr. W. Parmenter, builder, of Braintree, Essex, under the superintendence of Messrs. James Brooks, Son, & Godsell, of London, who also restored the XVth century western tower about three years ago.

CLUB PREMISES, DOVER.—The enlarged premises of the Dover Institute were opened a short time ago. The work has been carried out by Messrs. R. & G. Brisley from plans drawn by Mr. F. G. Hayward.

SCHOOL, GRANTHAM.—New school buildings have been opened for the Governors of King's School, Grantham. The Governors appointed Mr. John Bilson, F.S.A., of Hull, as their architect, and, after consultation with him, they decided to erect a new school building next the Brook-street frontage, and new dormitories and accommodation for boarders next the Castle-gate frontage, and to remodel the kitchen offices. The new structure is two stories in height, and has four classrooms on each floor, approached by a wide corridor from the principal entrance in the centre of the Brook-street frontage, and from the two entrances from the playground. Of the ordinary classrooms, seven are planned to accommodate twenty boys each, and one thirty boys. The classrooms are fitted with single desks, and heated by ventilating firegrates.

This building also includes the rooms for science teaching. The physics laboratory, on the ground floor, is 36 ft. long by 24 ft. wide, and is fitted with working benches for twenty students, sinks, cupboards, and sliding blackboards. Above this is the chemistry laboratory, also 36 ft. long by 24 ft. wide, fitted with working benches for twenty-four students. The lecture-room, which adjoins the chemistry laboratory, is 25 ft. long by 24 ft. wide, with accommodation for forty students. The buildings are faced with Ancaster stone, and the roofs are covered with Colleyweston stone slates. Over the entrance doorway are the Royal Arms, with three shields below, displaying respectively the arms of Bishop Fox, of Corpus Christi College, Oxford, and of the town of Grantham. The extension of the boarding-house was commenced in February, 1903, and it has been occupied since the middle of this year. It comprises a new building next Castle-gate, with a return connected with the older dining-hall and dormitory. These buildings are partly of three and partly of two stories in height. On the ground floor is a large dayroom, masters' sitting-rooms, studies, changing-rooms, and lavatory. On the first and second floors are three new dormitories providing additional accommodation for thirty boys, masters' bedrooms, bathrooms, etc. The school has been almost entirely redrained.

NATIONAL BANK OF SCOTLAND.—An extension of the premises on the east side of Nicholas-lane, Lombard-street, is being built by Messrs. George Trollope & Sons and Colls & Sons from plans and designs made by Mr. J. Macvicar Anderson. The adjoining premises, now occupied by the National Bank, were taken over by them about thirty years ago from the Agra Bank.

PRESBYTERIAN CHURCH HALL, PELAW.—The memorial-stone of church buildings at Pelaw-on-Tyne has just been laid. The estimated total cost is 1,573*l*. The architects are Messrs. Badenoch & Bruce, of Newcastle, and the contractor is Mr. Wm. Foster, of Pelaw. The hall is designed in a plain treatment of Early English work, the walls will be faced with red pressed Pelaw bricks, and finished with stone dressings. The length of the hall is 50 ft., and its width 36 ft., and it is divided into nave and aisles by cast-iron columns and arches, the nave being carried up above aisle roofs and having clerestory windows, and open timber roof. The aisles will be divided off by curtains into classrooms for Sunday school purposes. The entrance is at the west end, and gives access to framed and glazed inner porch. Behind the hall are classroom and vestry, and a corridor for exit. All the joiners' work will be in pitch-pine, stained and varnished. The floors throughout will be wood block laid on the herring-bone pattern on concrete, and the seating will be by chairs; the heating by low-pressure hot water, Messrs. Emley & Sons, Ltd., having secured the contract for this work.

PALACE THEATRE, GRIMSBY.—The new Palace Theatre and buffet, which is situate at the corner of Victoria-street and Corporation-road, Grimsby, has just been completed. Externally the buildings are principally of red Accrington bricks, with buff terra-cotta dressings. The elevation to Victoria-street is early Victorian in style, and the central feature is surmounted by a large tower, capped with a cupola and flagstaff; this is flanked on either side by smaller octagonal turrets, with a terra-cotta gable in the centre supporting an allegorical figure representing "Music." Along the whole frontage to the theatre is placed an ornamental iron and glass verandah. The buffet adjoining is placed at the junction of Victoria-street and Corporation-road. There are eight exits provided from various parts of the house, and the building is to accommodate 2,000 persons. The theatre consists of a pit, orchestra stalls, grand circle, four private boxes, and a gallery. Retiring-rooms for ladies and gentlemen, together with promenades at the rear of the grand circle, etc., are provided. The main entrance is placed in the centre of the building in Victoria-street through a hall, with staircases right and left leading to the circle, the walls of which are lined with ornamental tile dado. The decorations are carried out in Louis XV. style, the principal colouring being cream and gold, relieved with turquoise-blue and rose tints. The whole of the theatre will be lighted by electricity. The stage is 60 ft. by 30 ft. Dressing-rooms and other apartments contiguous to the stage are arranged at the back thereof. The architects are Messrs. Owen & Ward, of Birmingham, and the general contract has been carried out by Messrs. Hewins & Goodhand, of Grimsby. The other sub-contractors engaged on the works are Messrs. Mallin & Co., of West Bromwich, who have executed the fibrous plaster work and decoration and the Uralite fireproof curtain to stage. Messrs. Ludlow & Knight, of Birmingham, are the electricians.

ISOLATION HOSPITAL, NEAR CHESTERFIELD.—A new isolation hospital for the Chesterfield district was opened on the 7th inst. by the Mayoress of Chesterfield. The hospital, which is situated at Penmore, Hasland, has cost 9,400*l*., and it has been erected by a joint committee representing the Chesterfield Corporation and the Urban District Councils of Whittington, Newbold, and Brampton. It comprises five distinct blocks, standing about 20 yds. apart, on an extensive site, with a southern aspect, about 200 yds. from the Chesterfield and Mansfield main road. The administrative block is a three-story building, with accommodation for eight or nine nurses. The scarlet fever block provides sixteen beds, and the enteric fever block ten beds, and there is a third block, with four beds, for cases of diphtheria. There is a laundry for disinfecting clothing. In the upper story of the building for scarlet fever cases is a sun bath. It is a large room, the outer walls and roof of which are mainly composed of glass. In this room juvenile patients will be allowed to play when there is sunshine. On the ground floor of this block are wards which may be used for delirious cases or for private and paying patients. The block for diphtheria cases has two wards, with two beds in each ward. All the buildings are of plain brickwork, and the fever blocks are provided with glass verandahs on the south side. The convalescent patients are provided with a space in which to promenade. Mr. G. E. Bolshaw, of Southport, was the architect, and Mr. D. Brown, of Hasland, had the building contract.

NEW CHEMICAL LABORATORIES, GLASGOW UNIVERSITY.—The new chemical laboratories at Glasgow University are now almost ready for use. Although between 10,000*l*. and 12,000*l*. has been spent upon the structures alone, they are intended only for temporary occupation. The main purpose of their erection was the necessity for coping with the great increase in the number of students who have taken advantage of the chemical laboratory at Gilmorehill in recent years. The buildings were designed by Mr. J. J. Burnet, architect. Formerly, students of all grades worked in one laboratory, now, however, the juniors and the seniors have each their own buildings. These are almost side by side, and are connected by a covered passage or bridge. The senior work will be undertaken in a building of three stories—on the top floor being the physical laboratory, and on the middle floor the laboratory for the study of organic chemistry, while the metallurgical department is housed in the basement. The physical laboratory is a large apartment, fitted with all the latest appliances. Several smaller rooms are adjacent to the laboratory. These include a private research laboratory, a dark-room for photography, a workshop, and a small lecture hall of semi-circular shape. From the lecture desk the gallery for the accommodation of students rises at a precipitous angle almost to the ceiling. It is seated for 100 persons. On the second floor, leading off the lecture hall, there are a preparation-room for the lecturer, and a small private laboratory. The main hall for the study of organic chemistry, like that fitted up for physical chemistry, is well arranged and splendidly appointed. The whole of the new departments are supplied with draught chambers, into which air is driven by two fans each of 1½ h.p. In addition to the organic laboratory there are on the second floor, rooms for gas analysis and microscopic work (with a dark-room for photo-micrography); also a combustion furnace-room, and a bomb-room—the latter so named because experiments involving slight explosions will be conducted there. The metallurgical department in the basement is a valuable addition to the equipment of the University. It includes a cellroom with accumulators, and a 50 h.-p. cable, and a special room where the fan apparatus is placed. This apparatus is driven by electricity, and is set in operation by switches in the janitor's office. Adjoining the fan chamber there is a furnace-room, which supplies hot water for the heating of the whole establishment. The junior laboratory has accommodation for seventy-six students. Surrounding it are a series of apartments for special branches of work.—*Glasgow Herald.*

NURSES' HOME, AIRDRIE, N.B.—On the 13th inst. the nurses' home, erected at the corner of Clark-street and Motherwell-street, Airdrie, for the nurses of the Airdrie and District Nursing Association, was opened. Mr. J. Maurice Arthur was the architect.

NEW OFFICES, WHESSOE FOUNDRY, DARLINGTON.—These buildings, recently completed from the designs of Mr. W. Hargreaves Bourne, architect, Darlington, are built of Huncoats plastic red bricks. The corridors, halls, staircase, etc., are covered with a dark-green tile dado 4 ft. high, and white tiles 5 ft. high in lavatories, above which the plaster is brought flush, and the floors are laid with black-and-white tiles by Messrs. Doulton & Co. All the ground floor rooms are laid in pitch-pine block flooring. The staircase is of Stuart's granolithic stone. A special feature of the design is the entrance waiting hall, with gallery running round on first floor, open to a domed ceiling light, filled in with coloured leaded lights. The board-room has a ceiling in elliptical section to obtain extra height. The drawing-room is open to the apex of the roof, and ceiled to the underside of the rafters, the principals showing in the room. The whole of the internal fittings and fixtures have been supplied by the North of England School Furnishing Company, Darlington. The contractor was Mr. Frederick Shepherd, of York, his sub-contractors being Messrs. Lishman & Son, plumbers; Messrs. Robinson & Son, plasterers; and Messrs. Mossom & Son, painters; all of Darlington.

NORWICH AND LONDON ACCIDENT INSURANCE PREMISES.—The new head office, which the Norwich and London Accident Insurance Association are building in St. Giles'-street, is being erected from the designs of Messrs. Skipper, architects, Norwich. Messrs. John Youngs & Son are the builders, while the stonework has been executed by Mr. E. W. Potter.

WORKHOUSE INFIRMARY, CHESTERFIELD.—Messrs. Benham & Sons ask us to mention that in this building, briefly described in our last issue, the whole of the cooking apparatus, laundry apparatus, and hot-water work was carried out by their firm.

PEOPLE'S PALACE, BELFAST.—A section of this building was recently opened. The structure stands on a site with frontages to Donegall-road, Utility-street, Felt-street, and Eureka-street, the main entrance facing Donegall-road. The architect for the work is Mr. W. J. W. Roome, the builders being Messrs. M'Laughlin & Harvey. Messrs. Musgrave & Co. are responsible for the heating arrangements, and the plumbing work has been carried out by Mr. John Dowling.

CLUB PREMISES, MELTON MOWBRAY.—On the 15th inst. the Constitutional Club, which has been erected in Sherwood-street, Melton Mowbray, was opened by Lady Victoria Manners. The building is a two-story one, consisting of red bricks and stone dressings. It has been erected by Mr. C. Barnes, whose tender amounted to 1,740*l*., from plans prepared by Mr. E. Jewes.

SANITARY AND ENGINEERING NEWS.

THE UPPER PENN SEWAGE WORKS.—The present population of the district drained is 3,133. The works are, however, designed to deal with the sewage from a population of 3,500, and are so constructed as to be easily capable of extension should that become necessary at any future time. The area of the district is 1,995 acres; the area of the land purchased for sewage purification purposes is 23·66 acres. The area sewered is a most straggling one, and has necessitated, in comparison with the population dealt with, a very great length of sewers. Altogether there have been about nine miles of sewers laid, consisting of 6-in., 9-in., 12-in., and 15-in. earthenware and cast-iron pipes. The whole of these sewers gravitate into the receiving chamber at the entrance to the outfall works. From this chamber there are three outlets, one being the main 15-in. sewer to the tanks, which carries the ordinary dry-weather flow of sewage, and also any excess up to three times the dry-weather flow, this being the maximum quantity which will be dealt with through the bacteriological tanks and filters. Any excess over this quantity, from three times up to six times the dry-weather flow, will be conveyed to the high-level portion of the land through a separate 12-in. stoneware and half-pipe carrier, and will be treated over an area of about 9 acres. The third outlet from the receiving chamber is a 9-in. pipe leading direct to the brook, and this is so arranged that in time of flood any access over six times the ordinary flow of sewage will be carried direct to the brook. The sewage, before flowing into the tanks, passes through two detritus and screening chambers, for the purpose of arresting road detritus, flocculent matter, etc. From these chambers the sewage flows by means of submerged inlets into the covered bacteriological tanks. These are two in number, and are each 80 ft. long by 17 ft. 6 in. wide, with an average depth of six feet. The total capacity of the two tanks is 105,000 gallons, which is equal to one day's flow of sewage from a population of 3,500 people at 30 gallons per head. During its passage through the tanks, the sewage is broken down and

liquefied by bacterial agency, and prepared for treatment on the filter beds. The tank effluent passes off by means of submerged outlets, and is conveyed to a measuring chamber centrally situated with regard to the three circular filters. From the measuring chamber the tank effluent will be discharged automatically at intervals of from twenty minutes to half an hour, varying with the flow of sewage, through patent revolving spreaders on to the surface of the filter beds. These spreaders are so designed that an equal dose per square yard of filter area will be given at each application. With the ordinary flow of sewage the tank effluent will be discharged on to the filters at the rate of 60 gallons per square yard per twenty-four hours. With the maximum amount of three times the ordinary flow the rate will be 180 gallons per square yard per twenty-four hours. The three percolating filters are circular in plan, and each 78 ft. in diameter. The filtering material is local gravel, varying in size from about 2½ in. to ¼ in. The sewage, after percolating through the filters, is collected by means of aërating effluent channels, and conveyed into carriers round the outside of each filter, from which it is conveyed on to the lower portions of the land, over which it will be finally irrigated before being allowed to pass into the brook. Half-pipe distributing carriers are to be constructed for the purpose of distributing storm water, or raw sewage if desired, over the land, and the land will be under-drained with open-jointed, socketed pipes. The whole of these under-pipes will gravitate to an effluent discharge chamber, to be constructed at the lower corner of the field, from which the effluent will pass to the brook. The estimated cost of the whole of the works described was 14,000*l.* The Rural District Council, however, were fortunate in letting the contract at a very favourable time, which not only enabled the carrying out of the contract, but also various additional works, without exceeding the estimate. Messrs. R. E. W. Berrington & Son are the engineers.

WATER SUPPLY, PORTPATRICK, N.B.—The new water and drainage scheme at Portpatrick is now nearing completion. Mr. W. Robertson Copland, C.E., Glasgow, was appointed engineer for the scheme, and in December, 1902, the District Committee of the County Council decided to proceed with it. Four acres of ground were secured at Enoch, two miles from the town, and 340 ft. above sea-level. Messrs. T. Forgan & Son, Perth, were the contractors, their tender being about 7,000*l.* Early last year the work was commenced under the direct supervision of Mr. William Forgan, C.E., Perth, for the contractors, and Mr. Robert Millar, Mauchline, inspector of works, for the engineer. The reservoir at Enoch has a storage of 8,000,000 gallons, and the filtered supply in the clear-water tank is 35,000 gallons. In all about three and a half miles of water pipes have been laid. For the sewage, over two miles of pipes have been laid in the town area, the sewage discharging into the sea at Culvert Bay, on the north side of the town.

VENTILATION OF SEWERS.—On Monday the Public Health Committee of Kensington Borough Council reported having had under consideration a letter from the Lewisham Borough Council forwarding copy of a report of the Borough Surveyor adopted by them with regard to the ventilation of sewers, in which an opinion is expressed that the best means of remedying nuisances of smells emanating from surface road ventilators would be to require such ventilators to be placed much closer together than at present, and that steps should be taken with a view to the repeal of the London County Council Drainage By-law, made on October 30, 1900, under section 202 of the Metropolis Management Act, 1855, which requires the trapping of drains, and asking co-operation in approaching the London County Council with the object of obtaining the repeal of the by-law referred to. The report of the Kensington Committee proceeded as follows:—

> The efficient ventilation of the sewers of the metropolis being a matter of such supreme importance and urgent necessity, we consider the question can only be satisfactorily dealt with by united action on the part of all the authorities concerned; and with a view to a solution of the difficulty, we consider that the London County Council should be invited to convene a conference with the Metropolitan Borough Councils, in order that a comprehensive scheme on scientific lines could be formulated. We much deprecate any such makeshift action as the multiplication of existing road gratings, the nuisance from which is, in our experience, continually on the increase. We are of opinion that the suggested omission of the intercepting syphon would, where the main drain passes under or through residential or business premises (which is very largely the case in Kensington), be exposing the inhabitants and workers to grave risks, without any appreciable alleviation of the evil complained of; and we strongly deprecate any interference with the recognised standard of domestic sanitation as set up by the London County Council in their by-laws.

The London County Council are to be asked by the Kensington authorities to convene a conference to consider the best means of ventilating the sewers throughout the metropolis.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The executors of the late Mr. Richard Hardy, C.E., brewers' and maltsters' architect, Nottingham, have entered into agreement with Mr. A. Miller Baily, architect, brewers' and maltsters' consulting engineer, 9, St. Peter's-gate, Nottingham, whereby the two practises will in future be carried on by Mr. Baily, under the style of "Hardy & Baily," Bentinck Buildings, Nottingham. Mr. Baily was for ten years managing chief assistant to the late Mr. Hardy.

PROPOSED NEW WATERWORKS, BUGLE.—An inquiry was recently held at Stenalees by Colonel A. G. Durnford, R.E., Local Government Board Inspector, into the application of the St. Austell Rural District Council for sanction to borrow 2,300*l.* for works of water supply for Bugle and Stenalees, including the construction of a reservoir, with a capacity of 178,000 gallons, at Stenalees. Mr. H. S. Hancock, engineer, is responsible for the scheme.

THE MARSHES, WALTHAMSTOW AND LEYTON.—Six acres of common land in the marshes are marked for appropriation by the promoters of a Bill for the construction, upon the "tube" system, of an electrical railway from Bridge-road, Hammersmith, by way of Piccadilly, Gracechurch-street, Stoke Newington, and Palmer's-green, to Walthamstow.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held in London, December 9 and 10, nineteen candidates presented themselves. The following six candidates were awarded a certificate:—A. J. Catley, Reading; Lancelot A. Cooper, West Ealing; James Ewing, Lloyd-street, W.C.; E. Bertram Hartfree, Camberley; A. E. Powell, Stoke Newington; and G. H. Stevenson, Shipnal.

CEMENT PRODUCTION IN THE UNITED STATES.—From a report recently issued by the Department of the Interior at Washington, it appears that the total production of hydraulic cement in the United States in 1903 was 29,899,140 barrels, valued at 31,931,340 dols., as compared with 25,753,504 barrels, valued at 25,366,380 dols., produced in 1902. Of the total production in 1903, 22,342,973 barrels, having a value of 27,713,319 dols., were Portland cement. The production of natural rock cement was 7,030,271 barrels, valued at 3,675,520 dols. The production of Pozzuolano, or slag cement, was 525,896 barrels, valued at 542,502 dols. The increased production of Portland cement in 1903 resulted in a glutted market, which made the artificial product so low in price in the eastern part of the country as to interfere seriously with the production of natural rock cement. Many of the plants whose output is exclusively the natural cement were, for this reason, shut down during a large part of the year.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—The usual monthly meeting of this Association was held at the Builders' Exchange on Thursday evening last week, Mr. J. D. Cook, President, occupied the chair. In addition to the usual business of the monthly meeting, there was the investiture of the President with a new gold chain and medallion, as a badge of office. This ceremony was performed by Mr. A. J. Forsdike, who briefly stated the origin of the idea of obtaining this presidential badge, and referred to the able, energetic, and whole-hearted way in which Mr. Cook had carried out the duties of President. Councillor Longden and Mr. J. Biggin also joined in the congratulations to the President. Mr. Cook, in reply, thanked Mr. Forsdike for the kind words he had expressed, and compared the position and status of the Association at the present day with what it was years ago, and said he felt that, great as had been the improvement, there was still work to be done, and he hoped that the future presidents would be encouraged to use every effort to further the work of the Association. The badge, which consists of gold links, bearing the names of past presidents, with a button representing the York Rose between each link, and a pendant with the Sheffield coat of arms, and bearing the name of the Association, is the work of Messrs. Walker & Hall. Another feature of the meeting was the presentation, by Mr. Arthur Mastin, of a large framed portrait of his father, the late Mr. Joseph Mastin. A vote of thanks was accorded to Mr. Mastin for the gift.

CHURCH BUILDING SOCIETY.—The incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting on the 15th inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building a new church at Netherton, All Souls, near Maryport, Cumberland, 140*l.*, in lieu of a former grant of 100*l.*; rebuilding the churches at Forton, St. John, near Gosport, Hants, 250*l.*, in lieu of a former grant of 200*l.*; and Highweek, St. Mary, near Newton Abbot, 85*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Cleeve Prior, St. Andrew, near Evesham, 30*l.*; Newington, St. Mary, Kent, 10*l.*; Oxenton, St. John the Baptist, near Cheltenham, 15*l.*; and Feckenham, St. John the Baptist, near Redditch, 30*l.*, in lieu of a former grant of 20*l.* Grants were also made from the special Mission Buildings Fund towards building mission churches at Tunstall, St. Chad, Staffs., 30*l.*; and Woodland, St. Mary, near Butter Knowle, Co. Durham, 15*l.* The following grants were also paid for works completed:—Lydbrook, The Holy Jesus, near Ross, 15*l.*; Hither Green, St. Swithin, Kent, 50*l.*, making in all 150*l.*; Great Sturton, All Saints, near Horncastle, 15*l.*; and Broadheath, Christ Church, near Worcester, 80*l.* In addition to this, the sum of 125*l.* was paid towards the repairs of ten churches from trust funds held by the Society.

PROPOSED NEW TOWN HALL AND MARKET, DARTMOUTH.—Mr. Edmund Pearse, Inspector of the Local Government Board, held an inquiry at Dartmouth recently into an application of the Town Council for a Provisional Order under section 303 of the Public Health Act, 1875, to enable the Corporation to provide a new market house, town hall, and municipal offices. The Town Clerk said the present market house was in a very old and dilapidated condition, and the Council, therefore, desired to demolish the existing building, and to substitute an entirely new structure, comprising a market house, with modern stallage accommodation and conveniences, and a town hall, with municipal offices. To enable that scheme to be carried out it would be necessary to provide a sum of money estimated approximately at 7,000*l.* Mr. Smith, the Borough Surveyor, having given evidence, the inquiry closed.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—Employment in the building trades continued dull during November, and was rather worse than in October. It was much worse than a year ago. Employment with carpenters and joiners was bad generally, and worse than a month ago and a year ago. The percentage of unemployed trade union carpenters and joiners was 10·1 at the end of November, compared with 8·3 at the end of October, and 6·1 at the end of November, 1903. With plumbers it was bad in England and Ireland, and worse than a month ago and a year ago. In Scotland it was moderate, rather better than a month ago, but worse than a year ago. The percentage of unemployed trade union plumbers was 10·2 at the end of November, compared with 9·1 at the end of October, and 7·2 at the end of November, 1903. With bricklayers employment generally was dull, and about the same as a month ago, but worse than a year ago. With masons it was moderate in England, and worse than a month ago, but about the same as a year ago; in Scotland it was very dull, and worse than a month ago, but somewhat better than a year ago. With painters employment continued bad generally, and was worse than a year ago. Employment with plasterers was very slack, and worse than a year ago. With slaters and tilers employment was dull generally, being about the same as last month, but rather worse than a year ago. With builders' labourers employment was bad, and worse than either a month or a year ago. The returns received from seventy employers' associations show that employment generally was dull, and worse than a month and a year ago.—*Labour Gazette.*

Legal.

THE CHAILEY RURAL DISTRICT COUNCIL *v.* SIR W. GRANTHAM.

THE case of the Chailey Rural District Council *v.* Sir W. Grantham came before the Lewes Bench on Thursday morning, when the magistrates gave their decision. The chairman said the Bench found that defendant had sufficiently complied with certain of the by-laws, but that he had not sufficiently complied

with others. At the same time it seemed to them that defendant's plans were intended by him to indicate that the buildings he proposed to erect would conform to the requirements, and if he had failed in some particulars it had been due to misapprehension for which he was not wholly responsible. In the circumstances of the case, therefore, the Bench hoped it would not be necessary for them to give a more definite decision.

Mr. Grantham asked that upon the finding the summons issued under by-laws 45 and 46 be dismissed.

The Chairman: It is not a decision. We call it a finding, and we do not comply with your request.

Mr. Grantham said that after the intimation now given it might be necessary for Sir William's advisers to consider what steps had best be taken to compel the Rural District Council to adopt the arbitration decision of the Local Government Board, and to move the High Court on other grounds. He presumed there was no chance of the Bench coming to a decision.

The Chairman: If pressed we might come to a decision, but we hope it will not be necessary.

Mr. Grantham: Defendant wishes counsel to say he cannot be a party to any compromise on the evidence.

The Chairman: The Bench hope to hear nothing more of the case, and that the parties will be able to come together and proceed amicably.

CASE UNDER THE LONDON BUILDING ACT, 1894.

THE case of the King *v.* Kettle and the London County Council (*ex parte* James Ellis) came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley, on the 19th inst., for argument on a *rule nisi*, calling upon Mr. Kettle, the magistrate sitting at the Woolwich Police Court, and the London County Council to show cause why the magistrate should not deliver to Mr. Ellis, the applicant, a case, stated and signed by the magistrate, between the applicant and the London County Council. The facts were shortly as follows:—The applicant was summoned in August, 1903, by the London County Council for erecting a building in Cedar-grove, Charlton, beyond the general line of buildings contrary to the provisions of the London Building Act, 1894, and he was ordered to pull down a portion of the building, and was fined 40s. The applicant then asked the magistrate to state a case for the opinion of the High Court, but the magistrate declined. In August, 1903, the applicant told the magistrate that he wished to enter into a recognisance, and the magistrate told him that he should require a recognisance by himself and a surety in 50*l.*, and these recognisances were taken. On August 20, 1903, the applicant obtained a *rule nisi*, calling upon the magistrate to show cause why he should not be called upon to state a case, and in the following December the rule was made absolute. In September, 1903, the surety died, and the following month the applicant was made a bankrupt. When the order of December, 1903, was served on the magistrate, he held that fresh recognisances were necessary, and he declined to deliver the case, which had then been stated and signed, before fresh recognisances were entered into, but he offered to deliver the case on a fresh recognisance in 50*l.* being entered into. The applicant then obtained the present rule.

Mr. Daldy appeared to show cause against the rule, and Mr. Frank Gover supported it.

In the result their lordships held that the magistrate, in the circumstances of the case, was wrong in refusing to deliver up the case without further security, and the rule was accordingly made absolute, with costs, against the London County Council.

CASE UNDER THE PUBLIC HEALTH ACT, 1875.

THE case of the Redruth Brewery Company *v.* the Redruth Urban District Council, on the 20th inst., was decided in a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Kennedy and Ridley.

This was an appeal by the Brewery Company against a conviction by the magistrates under the Public Health Act, 1875, the magistrates having stated a special case for the opinion of the Court.

Mr. Clavell Salter, K.C., and Mr. Soper appeared for the appellants, and Mr. Foote, K.C., and Mr. Turrell for the defendants.

Mr. Clavell Salter said this was a case stated by the magistrates, and it raised the question whether certain works done upon a building in Redruth brought that building within one or other of the clauses created by the Public Health Act, in relation to which the work done upon an old building was to be considered as the erection of a new building. The facts were shortly these:—The houses in question were situated in the main street at Redruth, and they consisted, before they were touched at all, of a beerhouse, with dwelling-houses over and behind, and next door a hairdressers, also with living-rooms. The property belonged to the Brewery Company, and the Brewery Company were desirous, in the first instance, of pulling the property down and building new houses. They accordingly sent in plans to the defendants. The defendants, as the local authority, declined to pass those plans unless the Brewery Company would agree to set back their frontage and facilitate the street widening. The Brewery Company and the local authority could not come to terms, and therefore the Brewery Company elected to do some alterations instead. They proceeded with these alterations, and thereupon the local authority came down upon them and took these proceedings against them, and alleged that the Brewery Company were making a new building. The houses were built before 1849, so *primâ facie*, the by-laws did not affect these houses at all. The local authority had to satisfy the Court that they were not dealing with old houses, but new ones, and this they had done

The Lord Chief Justice: Do you say if you take down half of your wall and put up a new half, and then remove the other half and put up another new half, leaving the roof as it was on the old building, you would not be putting up a new building?

Mr. Salter: I submit no, because the old roof remains.

After hearing further argument, the Lord Chief Justice, without calling upon counsel for the respondents, in giving judgment, said he did not think the Court ought to interfere in this case, as it was stated. Where people did things to old houses they must take the consequences if it brought them within the purview of the Act. He came to the conclusion that the finding was one of fact, and that on the law there was no other evidence to come to a different conclusion that the magistrates had.

Justices Kennedy and Ridley concurring, the appeal was accordingly dismissed.

ACTON ANCIENT LIGHT DISPUTE:

MANDATORY INJUNCTION DISCHARGED.

IN the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Cozens-Hardy, last week, the hearing was concluded of the case of Kine *v.* Jolly, on the defendant's appeal from a judgment of Mr. Justice Kekewich, in the Chancery Division.

(The case was reported in the issues of the *Builder* of July 23 and 30, August 6, and December 17, 1904, and the facts of the case have been sufficiently stated.)

Mr. Hughes, K.C., and Mr. Vernon appeared for the appellant, and Mr. P. O. Lawrence, K.C., and Mr. Cann for the respondent.

Mr. Hughes, in replying on behalf of the appellant, contended that, on the findings of fact of Mr. Justice Kekewich, the plaintiff had failed to prove that the defendant had committed a nuisance, and, therefore, the action should be dismissed.

During the course of the arguments their lordships stated that they would accept the findings of fact of Mr. Justice Kekewich.

Lord Justice Vaughan Williams, in giving judgment, said that the question what tests ought to be applied in actions brought for obstruction of ancient lights, so as to ascertain whether a plaintiff had a good cause of action, had recently been very much discussed in the House of Lords in the case of the Home and Colonial Stores *v.* Colls, and the House of Lords intended to lay down rules which should be applied in future in cases of this class. Speaking without disrespect of the judges in the days gone by, he thought the decided cases were not quite consistent as to the tests to be applied. It was, therefore, obviously desirable that the differences, such as they were, in the principles laid down by those judges, should be settled once and for all. The great point of distinction between the two lines of cases was this. By one school of law the right of the house-owner gained by prescription, whether after the Prescription Act or before, was regarded as a mere right of property. By the other school this prescriptive right was regarded, not as a right of property to light, but as a negative easement, being a right to prevent a landowner from using his land so as to constitute a nuisance to the owner or occupier of a house on the adjoining land. The House of Lords had adopted the view that the only right gained by prescription was in the nature of a negative easement. That view was shortly expressed by saying that the rights which were to be enforced in respect of this prescriptive easement were those which would be properly enforced by an action of nuisance. An action of nuisance was distinguished from an action of trespass. An action of trespass was brought where a person's property had been invaded. An action of nuisance was brought when there was no invasion of another person's property, but where the wrong consisted in so using your own land as to injure your neighbour. An action of nuisance would not lie unless that which was complained of amounted to a substantial interference with the plaintiff's comfortable or profitable occupation of his dwelling-house or warehouse or house of business, as the case might be. It was desirable that somehow or other no man should be allowed to enforce rights, the enforcement of which would interfere with the good and progress of the community. He came to the conclusion that the result of all the judgments of the law lords was that, in order to constitute an actionable nuisance, the obstruction to the access of light must be such as to sensibly interfere with the plaintiff's comfort and convenience in the use of his premises, having regard to their character according to the ordinary notions of mankind in this country. Unless the obstruction amounted to that there was no cause of action. Mere proof that a certain percentage of light was taken away was not sufficient. Applying the principle laid down by the House of Lords in the Colls case to the findings of fact of Mr. Justice Kekewich, he agreed with the learned judge that there was here a good cause of action. He differed, however, from Mr. Justice Kekewich in thinking that the remedy ought to be damages and not a mandatory injunction.

Lord Justice Romer did not agree. In this case the house alleged to be injured was occupied by ordinary people for the common purposes of domestic living. It was not a case in which there was any extraordinary user of any kind of the premises. He considered, having regard to the decision of the House of Lords in the Colls case, that the principle to be applied to a case like the present was that the plaintiff must establish a nuisance. Taking the law as laid down in the case of the City of London Brewery Company *v.* Tennant, and strictly limiting it to the case in hand, an owner of ancient lights was entitled to sufficient light, according to the ordinary notions of mankind, for the comfortable use and enjoyment of his house as a dwelling-house, if, as in this case, it was a dwelling-house. In considering the question of the sufficiency of the light, the locality ought to be borne in mind, and light coming from other quarters ought not to be disregarded. Applying that law to the facts of the present case as found by Mr. Justice Kekewich, he (the Lord Justice) came to the conclusion that the plaintiff had failed to prove that the defendant had committed a nuisance. In arriving at that conclusion he was greatly impressed by the finding of Mr. Justice Kekewich that the plaintiff's morning-room was still a well-lighted room. To his mind the inference was that the plaintiff had now sufficient light for the ordinary purposes for which the room was used.

Lord Justice Cozens-Hardy agreed with the judgment delivered by Lord Justice Vaughan Williams.

By a majority of the Court, therefore, the judgment of Mr. Justice Kekewich was varied by the order for a mandatory injunction being discharged, and an inquiry as to damages being directed.

ACTION BY AN ARCHITECT.

THE case of Ayrton *v.* C. Arthur Pearson, Ltd., came before Mr. Justice Darling and a special jury in the King's Bench Division on the 16th and 19th insts., an action, brought by Mr. Ormrod Maxwell Ayrton, A.R.I.B.A., to recover from the defendants, 173*l.* 5*s.*, the value of certain drawings he alleged had been wrongfully detained by the defendants. The plaintiff also alternatively claimed damages from the defendants on account of the drawings having been lost or destroyed in consequence of the defendants' alleged negligence.

Mr. H. F. Dickens, K.C., and Mr. R. E. Moore appeared for the plaintiff, and Mr. Montague Shearman, K.C., and Mr. A. B. Cane for the defendants.

Mr. Dickens, in the course of opening the case, said his client had formed the idea of making studies for weather-vanes which should be applicable to particular buildings.

The plaintiff had made certain designs, amongst others being a design of a coach and horses which would be appropriate for an inn. Another was a sportsman with a gun and dog, for a gamekeeper's cottage, and there was also a design of a man engaged in studying the line of a putt, with a caddie standing at the flag, which would be suitable for a golf clubhouse. The pictures were not easy to compose, it being necessary that the figures should be so arranged as to make the surface greater on one side than the other. Certain of these designs were published in a journal called the *Studio*, and the editor of *Pearson's Magazine* seeing them wrote to the plaintiff asking him to supply some of his designs in order that they might be reproduced in that paper, together with an explanatory article. The plaintiff ultimately agreed to supply sixteen designs and an article for the sum of 10*l.*, and in due course the article and designs were sent to the editor. The editor, in the course of his correspondence with the plaintiff, had written saying he should not require the full copyright of his designs. On December 3, 1903, the plaintiff wrote to the editor asking for the return of his drawings, and received a reply stating that the original drawings had been mislaid or lost. Five of the drawings which had not been used were returned to the plaintiff. The designs which the plaintiff had made were not for sale, so that their value must be assessed by what they were worth to the plaintiff for exhibition purposes, and for hanging in his office to enable his clients to see the kind of work he was capable of doing.

The plaintiff was called, and stated that he valued the drawings at an average of fifteen guineas each.

Cross-examined,

He knew of no custom where pictures sent for a magazine article belonged to the people who published the article. He had not registered the copyright, either in the pictures which had been returned or in those which were published.

Mr. Arthur Blomfield, F.R.I.B.A., gave evidence that the pictures had very great artistic merit, and, in his opinion, were worth the sum plaintiff valued them at.

Professor Moira, of the Royal College of Arts, and Mr. A. L. Baldry, an art critic, also gave evidence to the same effect.

For the defence, Mr. Clement Shorter, editor of the *Sphere*, said that, in the absence of contract to the contrary, it was the custom that illustrations sent with articles became the property of the proprietor of the paper to which they were sent. He thought the price the plaintiff asked for his drawings was absurd.

Mr. G. Hammond, art editor of the *Illustrated London News*, Mr. Stanley Wood, an artist, and Mr. H. P. Adams, an architect and surveyor, also gave evidence in support of the defendants' case.

In the result the jury returned a verdict for the plaintiff for 40*l.*, and judgment was was given accordingly.

ACTION BY BUILDING OWNER AGAINST ARCHITECT.

THE Lord Chief Justice, in the King's Bench Division, on the 19th inst., delivered a considered judgment in the care of Hodgson *v.* Waugh. (The case was reported in the *Builder*, December 3 and 10, 1904.)

In this case, the plaintiff, Mr. George Herbert Hodgson, a loom maker, of Baildon, near Bradford, Yorkshire, sued the defendant, Mr. John Waugh, an architect and civil engineer, practising in Bradford, to recover damages for alleged negligent breach of duty as architect, and also damages for alleged breach of contract. The defendant denied the alleged breach of duty and contract, and counter-claimed for fees for work done and services rendered.

The short facts were these:—In 1900 Mr. Hodgson, the plaintiff, purchased a large estate in Hertfordshire, known as Hexton Manor, situated halfway between Hitchin and Luton. It consisted of a large hall, and some 1,600 acres of land, and there were also residences, known as "Summerville," Hexton Lodge, Pegsdon Lodge, and Meg Cottages. The property had been in the hands of mortgagees for some twenty years, and, a great amount of alteration and repair being necessary, the plaintiff, being acquainted with the defendant, engaged him to do the work. The plaintiff alleged that, during his absence abroad in consequence of ill-health, the defendant had caused work to be done, and buildings to be erected which were not in accordance with the plans and estimates he had prepared, and which had been submitted to and approved by the plaintiff. The plaintiff alleged that, in several instances, the defendant had not followed his instructions, and had expended a much greater sum on the different works than he knew plaintiff had intended spending. Defendant, on the other hand, justified everything he had done, and asserted that he had acted in the best interests of his client. During the course of the trial a great mass of detailed evidence was given with regard to the items of which the plaintiff complained—viz., as to the work on the various buildings on the estate, the cleaning of a lake, work upon a mill stream, a trout stream, and ponds, and, on November 29, his lordship reserved judgment.

Mr. Montague Lush, K.C., Mr. Clavell Salter, K.C., and Mr. Compston appeared for the plaintiff, and Mr. Tindal Atkinson, K.C., and Mr. F. P. M. Schiller for the defendant.

His lordship delivered a long and elaborate judgment, in the course of which he said if he had understood the character of the case at the first he would not have tried it, but have sent it to an official referee. There was no doubt that the plaintiff had made charges against the defendant of a most serious character, but these had been rightly abandoned. One of the suggestions made was that the defendant had passed off as original plans of his own plans prepared by other people. Mr. Lush, at the close of the case, had stated that he did not suggest that the defendant had been guilty of fraudulent conduct, and a few days later he made a similar statement in Court to the effect that the plaintiff did not wish to suggest that the defendant had been guilty of fraud. All charges of fraud were therefore withdrawn, and that was quite proper. Those charges ought never to have been made. His lordship then dealt at considerable length with the oral and documentary evidence relating to the various heads of claim in the statement of claim (fully reported in our columns), and came to the conclusion that there was no justification for the allegations that had been made against the defendant in his capacity as an architect. There was, he said, no doubt that the plaintiff did complain of the amount the alterations, etc., had cost him, and which, unquestionably, exceeded his expectation, and this, perhaps, led to charges being made which were now quite properly withdrawn. His lordship was of opinion, on the evidence, that Mr. Dean, the holder of the plaintiff's power of attorney while the plaintiff was abroad, acted in the absence of the plaintiff as his authorised representative, and that the defendant consulted with him as such as to the works that were being effected. Mr. Dean also made reports to Mr. Hodgson from time to time as to the character of the work carried on. No suggestion was made that Mr. Dean had not carried out his duties properly. He was of opinion that the evidence was wholly insufficient to satisfy him that there had been any breach of contract on the part of the defendant. His lordship then went *seriatim* through the particulars in the defendant's counter-claim, and, in the result, found that defendant was entitled to 1,018*l.* He accordingly entered judgment for the defendant on the claim, and also for him on his counter-claim for 1,018*l.*, with costs. He said, in conclusion, that he sympathised a great deal with the plaintiff, as he certainly, at the outset, had thought the various works on the estate would be carried out at a much less cost than the contract price. The plaintiff at the time the works were executed was away from home, and was seriously ill, and he was satisfied that his memory betrayed him as to many points as to which he thought he had cause for complaint, and he was led to make charges against the defendant which he ought never to have made. He was satisfied that the defendant, in what he had done, had acted honourably, and that he had done nothing which gave the plaintiff a cause of action against him.

Mr. Clavell Salter: I ask your lordship to stay execution.

His lordship said he would on the terms that, if the plaintiff wished to appeal, he paid the defendant's solicitors the taxed costs of the action on receiving from them the usual undertaking to return the costs if the appeal should prove successful, and the plaintiff would also have to pay over to the defendant the 1,018*l.* found due to him on his counter-claim. There was no reason why the defendant should be kept out of his money any longer.

ALTERING LEASEHOLD PREMISES WITHOUT LESSORS' PERMISSION.

THE case of Bailey and others *v.* Lewis came before Mr. Justice Swinfen Eady in the Chancery Division on the 9th inst., on a motion by the plaintiffs that a fit and proper person might, at the cost of the defendant, be appointed to carry out such of the acts required to be done so as to comply with the mandatory injunction granted by the judgment in the action as modified by an agreement of November 1, 1901.

It appeared that the defendant was lessee of premises Nos. 16 and 17, Holles-street, W., and, by the lease, he was prohibited from altering the premises and using them for trade purposes. Defendant, however, made certain structural alterations in the premises. He pulled down the party wall and constructed flues to enable the premises to be heated with hot air. The plaintiffs commenced an action against the defendant, and obtained an order in the Chancery Division, on February 8, 1901, restraining defendant from altering the premises, and from permitting the alterations he had made to remain without the plaintiffs' consent. The defendant, not complying with this order, the plaintiffs obtained leave, on October 24, 1901, to issue a writ of attachment against the defendant. After that an agreement was entered into on November 1, 1901, between the plaintiffs, Lord Howard de Walden, and the defendant, an order being obtained discharging the order of attachment and staying its operation, this order being without prejudice to the judgment of February, 1901, save and except as the same was modified by the agreement, and of the plaintiffs' right to apply to the Court to enforce obedience to the said order. The defendant, having failed to obey the order as modified by the agreement, Mr. Justice Swinfen Eady directed that a writ of attachment should issue against him, and he was imprisoned. That was on June 12, 1903. The defendant was released from prison on July 10, 1903. In the affidavit that the defendant had made in support of his application for release from prison the defendant stated that he had instructed his architect to give orders to the contractors to carry out the judgment as modified by the agreement, and apologising for his contempt. It was now stated that the defendant had complied with all the requirements of the mandatory injunction except as to the flues, the defendant's case being, however, that the flues had been built with the plaintiffs' consent, and, therefore, that there was no obligation on him to remove the flues and restore the fireplaces formerly in the premises.

At the conclusion of the arguments of counsel, Mr. Justice Swinfen Eady, in giving judgment, said that the defendant had been playing with the Court, and he directed that the works should be carried out under the direction of the Court. He referred the matter of the appointment of a fit and proper person to carry them out to Chambers, and ordered the defendant to pay the costs of the motion.

WORKMEN AND THE CHECK SYSTEM.

MESSRS. F. & H. F. HIGG, builders, of Loughborough Junction, were summoned at the South-Western Police Court, on the 16th inst., by two of their bricklayers, Charles James Offord and William Back, who sought to recover sums deducted from their wages. The case was treated by the parties concerned as a test one.

The defendants, with a view of checking their workmen, and satisfying themselves that they were in daily attendance at their work, instituted a system by which each man was required to take a ticket, identified by a number, and place it in a box for reference. Defendants held that, if the men neglected to observe these conditions, they forfeited all claims unless they reported themselves at once to the responsible official. There was no attempt to deny that the complainants actually worked; in fact, this was admitted; but as they failed to observe the rules and regulations, payment was withheld.

After a lengthy argument the magistrate thought it unreasonable to refuse payment when work was actually done. He therefore made an order for payment of the amounts claimed, with costs.—*Daily News.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

26,509 of 1903.—W. NICOL: *Windows.*

This invention relates to windows. According to the invention the sash frames are mounted to swivel on hinges, and, when these sash frames are made to slip up and down, the hinges would consist of plates with longitudinal bowled ends coiling into each other, the part of hinge screwed to fixed frame being formed with a flush plate which extends past the bowl part of hinge and prevents the other hinged plate and sliding part from rubbing

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

against woodwork in sliding up and down, and makes same easier fitted, the flush plate acting as a guide and giving a double thickness of metal and corresponding strength in screwing plate to fixed frame. In windows where the sash frames do not slide, the hinged plates would be formed of a kneed or bent shape at the part where the bowl of hinge begins to form.

45 of 1904.—J. RICHMOND and R. F. CAREY: *Electrically-controlled Lifts.*

Mechanism for operating and controlling lifts, characterised by the employment of two travelling conducting wires connected to an insulated block attached to and moving with the balance weight or counterpoise of the lift, in such a manner that the conditions of installation and standardising of the parts are fully secured, said travelling conducting wires being employed in connexion with means for establishing electrical connexion from each floor or from the cage to either wires and a negative main, and a switch to determine the direction of movement of the cage.

1,570 of 1904.—R. STANLEY: *Manufacture of Tiles, Quarries, Paving Blocks, and Bricks.*

This invention relates to tiles, quarries, paving blocks, and bricks moulded from plastic or powdered substances, and is especially applicable to tiles and quarries made from clay or terra-cotta. The invention consists firstly of means and method for forming grooves in the edges of the tile, quarry, or other article during the process of manufacture, such grooves afterwards holding the cement when the articles are laid in position, with the useful result that the latter do not work loose or drop out of place after being set. Tiles and quarries made according to this invention will be serviceable for walls which are either vertical, sloping, or arched-shaped, such as for tunnels, or for any other purpose.

1,618 of 1904.—A HOCH and C. HANNEMANN: *Telescopic Tables, Telescopic Desks, and the like.*

A table, desk, or the like, and consists in the combination with a table board, of a prolongating plate, lying, if out of use, parallel to and beneath the table board, and means for guiding the prolongation plate into its proper position, consisting in substantially horizontal parallel grooves combined with inclined grooves.

1,619 of 1904.—E. WALDEN: *A Vertical Spring Gate or Door Latch.*

A vertical spring gate or door latch, consisting of a hollow cylinder provided with arms and plates for securing same to a gate or post, the cylinder having a spring and the reduced portion of a latch rod working therein, the top portion of the latch being provided with a knob or ring, while the bottom is shaped to slide in a slot and engage with a catch plate.

1,740 of 1904.—J. A. LIDVALL: *Method of Manufacturing Radiators for Heating Purposes.*

A method of manufacturing radiators having vertical flanges on the outer sides, which consists in making the side walls of several flat or curved pieces, and in putting together the same with suitable top and bottom pieces so as to form radiators of wave-shaped or similar horizontal section.

1,758 of 1904.—ASHWORTH, KIRK, & CO., LTD., and W. T. PEARCE: *Feeding Mechanism of Wood-Moulding or like Wood-Working Machines.*

According to this invention the upper feed roller is made in the form of a truncated cone, and with a flange on its reduced end of, say, about the same external diameter as its larger end. This flange is let into the fixed fence, which is recessed to admit it, so that the face of the flange is flush with that of the fence, and practically forms parts of the same. The axis of the conical feed roller is preferably parallel to that of the lower feed roller, and it is tapered so that the angle between its face and that of the lower roller corresponds to the angle between the upper and lower face in section of the sawn lengths of timber which are being moulded.

1,938 of 1904.—H. LINGARD: *Construction of Joints of Earthenware Drain Pipes.*

This consists, in the combination with the socket end of an earthenware drain pipe, of an encircling flange (being an integral part of same) provided with an internal groove to receive liquid cement, and having an opening through the top for the insertion of same.

5,057 of 1904.—A. T. BUNTING: *Flooring Cramps.*

A floor cramp, consisting of an eccentric frame surrounding said eccentric, a face plate pivoted to said frame, tongues on said frame to engage grooves in the body of the cramp, and means for effecting the working of the eccentric.

5,257 of 1904.—R. MORGAN: *Safety Guard for Hatchets and Adzes.*

The guard is made of tin to fit the sharp or cutting end of hatchet or adze, and is so made, by means of a row of holes and pin, to fit in same that one can fit several sizes. The bottom piece is made of wood. A lock could be placed on same when necessary, to prevent an offender taking the guard off and using hatchet or adze, as the case may be.

22,301 of 1904.—A. J. BOULT (Bayerische Betonbau-Gesellschaft, G.m.b.H.): *Building Blocks or Structures.*

Heavy blocks for ceilings, and the like, characterised by the construction of the hollow stone being reduced from a parallel girder with intersecting ribs, each block containing two or more intersecting ribs, and at the same time a projecting edge on one side, and a recess on the other side.

22,423 of 1904.—W. FAIRWEATHER (A. B. Nettleton): *Composition of Matter for Fireproof Paint or Coating.*

A fireproof composition, consisting of equal parts of finely-powdered carbide of silicon, and semi-liquid silicon of sodium, and from three to ten parts of calcium carbonate in 100 parts of the composition.

22,729 of 1904.—J. O. PARKINSON: *Removable Wall and Ceiling Coverings.*

A covering for walls or ceilings, consisting of a suitable frame, composed of parallel bars and two series of plates or tiles, one of which series is adapted to be engaged with the bars of said frame by means of an oblong flange or two oppositely projecting lugs formed at the free end of a concentric trunk thereon, and the other of which is adapted, by means of a concentric screwed shank, to be fixed to nuts slidably carried by said bars, two series of plates or tiles being formed with grooves and tongues so that they engage with each other.

22,730 of 1904.—C. H. SHOPPEE: *Facing Bricks.*

This invention relates to improvements in the bricks described in the Specification to Patent No. 17,881 of 1891. According to this invention, instead of making the dovetail at the back of the brick extend from end to end as before, it is now divided into two or more parts with spaces, preferably dovetailed between. By this means the bricks are not only lightened, but a more secure hold is also provided for the concrete.

22,896 of 1904.—A. L. LAVALLEY: *Garden Frames.*

A garden frame, comprising, in combination, a base frame or box, having ends of inverted V-shape, or span roof-like contour, a sash or light, consisting of two parts foldably connected together, and a rack and pin device at each side of the said parts.

1,899 of 1904.—J. GLOVER: *Method of and Appliances for Testing the Joints of Pipes.*

A method for testing pipe joints, which consists in forming a circumferential fluid-tight chamber round the joint on the inside of the pipe, forcing fluid under pressure into this chamber, and then observing where the pressure in the chamber remains constant or diminishes, whereby any leakage through the joint can be ascertained.

1,769 of 1904.—J. MORE: *Construction of Theatres and like Public Buildings.*

This relates to theatres and like public buildings, and consists in providing a flue above the stage, the flue being fitted with a damper adapted to be automatically or otherwise opened on a fire occurring upon, or in the vicinity of, the stage, in order that resulting flames or gases may be deflected therethrough and prevented from entering the auditorium.

6,045 of 1904.—F. A. WILKINS: *Supports for Street Decoration.*

A means for decorating and for supporting decorations, comprising light trellis or other arms adapted to secure to venetian masts, electric light and similar standards, or to houses whereby decorations can be extended over the street or in any other desired direction.

15,128 of 1904.—W. ECKSTEIN: *Treads for Staircases, Landings, Foot Paving, Floors, and the like.*

This consists in the arrangement and construction of staircase treads, landings, pavings, or the like, so as to allow of the interchange of such renewable portions or panels giving a number of different exchanges of wearing or working surfaces, by turning the panels round from back to front, or right to left, or by interchanging them one with another so as to obtain a maximum of wearing qualities from the surfaces treated.

22,547 of 1904.—H. H. LAKE (Chemisch Technische Fabrik Dr. Alb. R. W. Brand & Co., G.m.b.H.): *Process for Colouring Natural Stone.*

A process for staining or colouring marble and other natural stones throughout their substance with metallic deposits, consisting in dissolving metallic oleates in essential oils, and introducing them into the stone simultaneously with strong organic acids.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 7.—By BRIDGMAN & SON (at Hodesdon).

Roydon, Essex.—"Merryweathers" and 37 a. 2 r. 12 p., f., p.	£1,750
"King's" and "Smith's" Fields, 19 a. 2 r. 21 p., f.	735
"Wren's" and "Thorn Hoppett" Fields, 6 a. 3 r. 12 p., f.	365
"Shoulder of Mutton," etc., Fields, 30 a. 1 r. 23 p., f.	910

December 8.—By HENRY HENDRIKS (at Birmingham).

Solihull, Warwick.—Hampton-la., a freehold building plot, area 2,625 yds.	200
Moseley, Staffs.—113, Kingswood-rd., u.t. 71¼ yrs., g.r. 6l. 9s. 3d., p.	470
26, Kingswood-rd., u.t. 78¼ yrs., g.r. 4l., p.	200
Smethwick, Staffs.—Bampton-rd., f.g.r. 18l., reversion in 81¼ yrs.	460

December 12.—By J. H. BETHELL.

Hackney.—29 and 31, Holma-st., u.t. 20¼ yrs., g.r. 5l. 12s. 6d., w.r. 61l. 2s.	295
East Ham.—94, Lancaster-rd., f., w.r. 31l. 4s.	340

By GREEN & SON.

Hammersmith.—2, 2A, and 2B, South-st., u.t. 8¼ yrs., g.r. 4l. 4s., w.r. 67l. 12s.	120
Kew.—270, Kew-rd., u.t. 54¼ yrs., g.r. 24l., y.r. 75l.	575

By RICHARDSON & PEARCE-BROWN (at Selby).

Ellerton, etc., Yorks.—"The Priory Farm," 240a. 1r. 9p., f., p.	9,000

December 13.—By HY. H. COLLIER.

Acton.—Church-rd., f.g.r. 6l., reversion in 62 yrs.	175
24 to 30 (even), Montgomery-rd., f., w.r. 119l. 12s.	1,400
77, Antrobus-rd., f., y.r. 30l.	700
Fletcher-rd., f.g.r. 10l. 10s., reversion in 94 yrs.	240

By E. H. HENRY.

Clapham.—177 and 179, Abbeyville-rd., and 88, 90, and 92, Park-pl., f., w.r. 130l.	1,320

By LINNETT & LANE.

Harlesden.—70, Charlton-rd., u.t. 93 yrs., g.r. 5l. 5s., w.r. 39l.	250

By R. B. SIM & SON.

Forest Gate.—165 and 167, Odessa-rd., u.t. 71¼ yrs., g.r. 7l. 10s., w.r. 46l. 16s.	300
Stratford.—22, 24, 26, 30, and 32, Borthwick-rd., f., y.r. 134l.	1,940
Leytonstone.—10 to 20, 24 to 34 (even), Worsley-rd., u.t. 79¼ yrs., g.r. 36l., w.r. 297l. 14s.	2,280
45 and 47, Wragby-rd., u.t. 79¼ yrs., g.r. 6l., w.r. 49l. 8s.	410

December 14.—By THURGOOD & MARTIN.

City of London.—119, Leadenhall-st., "The Hercules Tavern," area 1,060 ft., a freehold rental of 200l., reversion in 14¼ yrs.	9,120

By PERCIVAL HODSON.

Walthamstow.—5, York-rd., f., e.r. 26l.	25

By E. & S. SMITH.

Barnsbury.—Richmond-rd., l.g. rents 64l., u.t. 37 yrs., g.r. 8l.	960

December 15.—By H. J. BLISS & SONS.

Kingsland.—114, Kingsland-rd. (s.), f., e.r. 60l.	865

By FAREBROTHER, ELLIS, & CO.

Burton-on-Trent, Staffs.—220 to 223, Shabnal-rd., u.t. 72¼ yrs., g.r. 10l., y.r. 80l. 12s.	850

By STIMSON & SONS.

Chelsea.—65, 67, 69, and 71, Church-st., f.; 289 and 289A, King's-rd., u.t. 6¼ yrs., g.r. 20l.	8,000
Shaftesbury-avenue.—1 and 2, Ham-yard, beneficial lease for 8¼ yrs., y.r. 155l., rising to 175l. (including coach and van builder's business and goodwill)	
Clapham.—61 to 67 (odd), Meadow-rd., u.t. 23¼ yrs., g.r. 5l., w.r. 153l. 8s.	680
Lambeth.—55, Lower Marsh (s.), u.t. 6¼ yrs., g.r. 11l., y.r. 60l.	100
Forest Hill.—1 and 2, Oxford-ter., u.t. 37 yrs., g.r. 8l., w.r. 48l.	230
Lee.—19, Blessington-rd., u.t. 48 yrs., g.r. 12l. 12s., e.r. 60l.	175
Plaistow.—101 to 117, 123 to 131, 137 to 145 (odd), Prince Regent's-la., u.t. 91 yrs., g.r. 75l., w.r. 346l. 12s.	630

By J. F. STONEHEWER & SONS.

Battersea.—37 and 39, Ashness-rd., u.t. 77 yrs., g.r. 13l., w.r. 83l. 18s.	540
Norwood.—St. Julian's Farm-rd., f.g.r. 7l. 7s., reversion in 76 yrs.	165

By NEWSON, EDWARDS, & SHEPHARD.

Euston-road.—George-st., l.g.r. 42l., u.t. 14¼ yrs., g.r. 10l.	245
Euston-st., l.g.r. 107l. 2s., u.t. 14¼ yrs., g.r. 17l. 2s.	635
Hackney.—400 and 404, Hackney-rd., f., y.r. 110l.	1,800
Caledonian-road.—41 to 57 (odd), Half Moon-cres., f., e.r. 340l.	3,850
Notting-hill.—Bolton-rd., l.g.r. 46l. 10s., u.t. 39 yrs., g.r. 1s.	710
Hackney.—Spurstowe-rd., l.g.r. 33l., u.t. 55 yrs., g.r. 1d.	630
Banbury-rd., l.g.r. 45l. 10s., u.t. 49 yrs., g.r. 4l.	720
Canonbury.—60, Pyrland-rd., u.t. 44¼ yrs., g.r. 6l. 6s., e.r. 46l.	420
Finsbury Park.—9, Alexandra-villas, u.t. 58 yrs., g.r. 12l. 10s., y.r. 66l.	515

Holloway.—Ingleby-rd., l.g.r. 90*l.*, u.t. 44½ yrs., g.r. 30*l.* £990
Tollington-rd., l.g.r. 28*l.*, u.t. 38 yrs., g.r. 2*l.* 385
Citizen-rd., l.g.r. 51*l.*, u.t. 38 yrs., g.r. 20*l.* 470
26, Carleton-rd., u.t. 58½ yrs., g.r. 10*l.*, e.r. 120*l.* 1,110
Southgate. — Chase-rd., "The White Hart Tavern," also house and two s., and houses adjoining, f., y.r. 122*l.* 8s. 3,400
1 to 6, Providence-row, f., w.r. 82*l.* 11s. .. 890

By STEPHENSON & ALEXANDER (at Cardiff).

Cardiff, Glamorgan.—1, 2, and 3, James-st. (s.), and 101, Bute-st. (s.), u.t. 43½ yrs., g.r. 5*l.* 15s., y.r. 350*l.* 5,250
7, Cathedral-rd., u.t. 50 yrs., g.r. 4*l.* 18s., y.r. 35*l.* 475

December 16.—By BRADSHAW, BROWN, & Co.

City-road.—36, Graham-st. (wharf), area 7,450 ft., u.t. 46 yrs., g.r. 150*l.*, e.r. 250*l.* 500
Poplar.—East India Dock-rd., "Canton Yard," u.t. 31½ yrs., y.r. 60*l.* (with goodwill of a job master's business) 400
97 and 99, East India Dock-rd., u.t. 26½ yrs., g.r. 30*l.*, e.r. 70*l.* 380
16, Newby-pl., f., w.r. 26*l.* 420
149, High-st. (s.), c., w.r. 46*l.* 16s. 355

By EASTMAN BROS.

Forest Hill.—27, David's-rd., f., w.r. 26*l.* 200
22, Montague-ter., f., w.r. 26*l.* 400

By MULLETT, BOOKER, & Co.

Hyde Park.—114, Westbourne-ter., and 114, Westbourne-ter-mews, u.t. 32½ yrs., g.r. 24*l.*, p. 1,130
Bayswater.—36, Princes-sq., u.t. 47½ yrs., g.r. 21*l.*, p. 900

☞ *Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent: r. for rent; f. for freehold: c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental: w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental: u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

W. M. (We cannot undertake to find answers to such questions).

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks.	1 12 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 8 0	" " "
Facing Stocks ...	2 5 0	" " "
Shippers	2 5 0	" " "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts ...	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ...	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks.....	4 8 0	" " "
GLAZED BRICKS. Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats.....	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers...	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "

BRICKS, &c.—(*continued*).

	£ s. d.	
Quoins, Bullnose, and Flats.....	14 0 0	per 1000 at railway depôt.
Double Stretchers	15 0 0	" " "
Double Headers...	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	less than best.
	s. d.	
Thames and Pit Sand.....	7 0	per yard, delivered.
Thames Ballast.....	6 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	" "
	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks...	2 4	" "
Red Corsehill "	2 5	" "
CloseburnRedFreestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.* Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK— Scappled random blocks	3 0	per ft. cube. "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
	s. d.	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green .	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles .	42	0 per 1000 at rly. depôt.
Hip and Valley tiles ...	3	7 per doz. " "
Best Brosely tiles.....	50	0 per 1000 " "
Do. Ornamental tiles	52	6 " " "
Hip and Valley tiles ...	4	0 per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6 per 1000 " "
Do. Ornamental do	60	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	0 " " "
Best Red or Mottled Staffordshire do. (Peakes).....	51	9 per 1000 " "
Do. Ornamental do.....	54	6 " " "
Hip tiles	4	1 per doz. " "
Valley tiles	3	8 " " "
Best "Rosemary" brand plain tiles.....	48	0 per 1000 " "
Best Ornamental tiles	50	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	8 " " "
Best "Hartshill" brand plain tiles, sand faced.	50	0 per 1000 " "
Do. pressed.....	47	6 " " "
Do. Ornamental do	50	0 " " "
Hip tiles	4	0 per doz. " "
Valley tiles	3	6 " " "

WOOD.

	£ s. d.	£ s. d.
	At per standard.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	" " 9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD. White Sea: first yellow deals, 3 in. by 11 in	At per standard. 23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in by 11 in.....	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals.....	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards.
Oddments	28 0 0	"
Seconds, regular sizes.....	30 0 0	"
Yellow Pine oddments	25 0 0	"
Kauri Pine—Planks, per ft. cube .	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0 0 9	0 1 0
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks, per ft. cube.....	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1½ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1½ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6
6 in. at 6d. to 9d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	5 15 0 ...	6 15 0
Compound Girders, ordinary sections	7 12 6 ...	8 15 0
Angles, Tees and Channels, ordinary sections	7 7 6 ...	8 7 6
Flitch Plates	7 15 0 ...	8 5 0
Cast Iron Columns and Stanchions including ordinary patterns	6 12 6 ...	7 15 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	6 15 0 ...	7 5 0
Staffordshire Crown Bars, good merchant quality.....	7 5 0 ...	7 15 0
Staffordshire "Marked Bars"	9 10 0 ...	—
Mild Steel Bars.....	8 5 0 ...	8 15 0
Hoop Iron, basis price	8 15 0 ...	9 0 0
" Galvanized	16 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron, Black— Ordinary sizes to 20 g.	9 0 0 ...	—
" " 24 g.	10 0 0 ...	—
" " 26 g.	11 15 0 ...	—

METALS (*continued*).

Iron—*continued*.	Per ton, in London. £	s.	d.		£	s.	d.
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	0	0	...	—		
Ordinary sizes to 22 g. and 24 g.	12	10	0	...	—		
" " 26 g.	13	10	0	...	—		
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	15	0	0	...	—		
" " 22 g. and 24 g.	15	10	0	...	—		
" " 26 g.	17	0	0	...	—		
Galvanised Corrugated Sheets—							
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	0	0	...	—		
" " 22 g. and 24 g.	12	10	0	...	—		
" " 26 g.	13	5	0	...	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	0	0	...	—		
Best Soft Steel Sheets, 22 g. & 24 g.	12	0	0	...	—		
" " 26 g.	13	5	0	...	—		
Cut nails, 3 in. to 6 in.	8	10	0	...	9	0	0
(Under 3 in., usual trade extras.)							

Lead, &c.	Per ton, in London. £	s.	d.		£	s.	d.
Lead—Sheet, English, 3lb. and up	15	7	6	...	—		
Pipe in coils	15	17	6	...	—		
Soil pipe	18	7	6	...	—		
Compo pipe	18	7	6	...	—		
Zinc—Sheet—							
Vieille Montagne ...ton	30	15	0	...	—		
Silesian	30	10	0	...	—		
Copper—							
Strong Sheet...per lb.	0	0	10	...	—		
Thin " ... "	0	0	11	...	—		
Copper nails ... "	0	0	10	...	—		
Brass—							
Strong Sheet ... "	0	0	9½	...	—		
Thin " ... "	0	0	10	...	—		
Tin—English Ingots ... "	0	1	4½	...	—		
Solder—Plumbers' ... "	0	0	6½	...	—		
Tinmen's ... "	0	0	8	...	—		
Blowpipe ... "	0	0	9	...	—		

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
" fourths	2d. " "
21 oz. thirds	3¼d. " "
" fourths	3d. " "
26 oz. thirds	4¼d. " "
" fourths	3¾d. " "
32 oz. thirds	5¾d. " "
" fourths	5d. " "
Fluted Sheet, 15 oz.	3¾d. " "
" 21 oz.	4¼d. " "
½ Hartley's Rolled Plate	2d. " "
⅓ " " "	2½d. " "
¼ " " "	2¾d. " "

Oils, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	5
" " in barrels	"	0	1	6
" " in drums	"	0	1	8
Boiled " in pipes	"	0	1	7
" " in barrels	"	0	1	8
" " in drums	"	0	1	10
Turpentine, in barrels	"	0	3	4
" in drums	"	0	3	6
Genuine Ground English White Lead	per ton	19	15	0
Red Lead, Dry	"	19	5	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

Varnishes, &c.	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALDERLEY EDGE.—For sewage disposal works at the sewage farm, for the Urban District Council. Messrs. J. Newton, Son, & Bailey, engineers, 17, Cooper-street, Manchester:—

G. Freeman & Sons ..	£2,628	3	2	H. Davis & Sons	£1,805	0	2
J. S. Dawson	2,616	19	10	W. Barrick ..	1,772	15	5
J. Owen	2,253	8	9	W. H. Worthington ..	1,582	12	6
A. Graham & Sons, Ltd.	1,950	0	0	I. Massey & Sons, Alderley Edge* ..	1,498	0	0
I. Byrom ..	1,914	0	0	Clayton Bros.	1,385	10	0
P. D. Hayes	1,897	18	3				

BLAENAVON.—For the partial rebuilding of the Griffin Hotel. Mr. R. L. Roberts, architect, Abercarn:—

J. Hatherley ..	£867	0	0	J. Morgan	£800	11	0
R. Tudor	840	0	0	N. Bagley, Abertillery* ..	793	10	3
J. Jenkins	840	0	0	E. Hooper	749	0	0
S. Poole	810	0	0				

BRISTOL.—For an extension to Messrs. T. Adams & Bros.' warehouse at Lawrence-hill. Mr. W. H. Watkins, architect, 15, Clare-street, Bristol:—

W. Cowlin & Son ..	£2,050	E. Love	£1,900
C. A. Hayes	1,997	A. J. Beaven	1,899
T. R. Lewis	1,950	G. Humphreys	1,890
R. F. Ridd	1,939	H. W. & E. J. Neale*	1,860

BROCKLEY.—For erecting a branch library, for the Libraries Committee of the Borough Council. Mr. A. L. Guy, architect, 4, Verulam-buildings, Gray's Inn, W.C. Quantities by Mr. H. Raven, 35, Southampton-street, Strand:—

F. H. Eley (Mordey & Meyer)	£5,791	0	0	Hibberd Bros.	£4,654	0	0
W. & D. Wilkins ..	5,367	0	0	H. Kent	4,644	0	0
R. L. Tongue & Co.	5,318	0	0	W. Smith & Sons	4,623	0	0
A. W. Robins	5,214	0	0	Stimpson & Co.	4,619	0	0
A. W. Jaggers & Co.....	5,178	15	1	R. T. Hughes & Co.	4,605	0	0
Staines & Son.	5,073	0	0	T. Pearce ...	4,600	0	0
H. Leney & Son	4,940	0	0	R. A. Dean & Co.	4,587	0	0
Thomas & Edge	4,905	0	0	Davey & Jones	4,568	0	0
J. Watt	4,850	0	0	B. E. Nightingale	4,535	0	0
A. F. Vigor & Co.	4,838	0	0	Patman & Fotheringham	4,527	0	0
Bulled & Co.	4,817	0	0	T. G. Sharpington	4,525	0	0
Aldridge & Son	4,800	0	0	Shelbourne & Co.	4,508	0	0
J. Smith & Son	4,740	0	0	J. A. Renwick	4,494	0	0
Cropley Bros.	4,736	0	0	Foster Bros.	4,433	0	0
G. Wales & Co.	4,726	0	0	Perry Bros...	4,347	0	0
W. Martin ..	4,699	0	0	Bragg & Sons	4,144	0	0
H. L. Holloway	4,667	0	0	F. J. Gorham, Greenwich*	3,955	6	0

GREAT GRIMSBY.—For new horse stables, cart-sheds, etc., King Edward-street, for the Co-operative Society, Ltd. Mr. A. Gooseman, architect, Grimsby:—

Rands & Lindup	£1,051	7	6	J. H. Thompson & Sons	£926	0	0
M. Hatcliffe ..	1,006	0	0	Hewins & Goodhand, Grimsby* ..	888	0	0
Gilbert & Kirton	965	0	0				
R. G. Kitching	930	0	0				

GREAT MISSENDEN (Bucks).—For two houses for Mr. Alfred Dunhill. Mr. J. Bruce Merson, architect, 76, High-road, Kilburn, N.W.:—

Patman & Fotheringham	£2,223	0		Aldridge & Son	£2,165	1	
M. Dymock	2,179	16		H. J. Wright ..	2,102	5	
				G. Parsons* ..	1,846	0	

CUCKFIELD.—For 3,400 yds. of 4-in. and 400 yds. of 3-in. cast-iron water mains, for the Rural District Council. Mr. D. Rankine, Waterworks Engineer, Council Offices, Hayward's Heath:—

	4-inch. Per ton.				3-inch. Per ton.		
J. & R. Ritchie, Middlesbrough*	£4	14	6	..	£4	18	0
H. Green & Co.	4	16	0	..	5	0	0
Holwell Iron Co.	4	17	6	..	4	19	0
A. G. Cloake	4	17	6	..	5	2	6
MacLaren & Co.	4	19	5	..	5	4	10
Birtley Iron Co.	5	0	0	..	5	0	0
Sheepbridge Coal & Iron Co.	5	0	0	..	5	2	6
Watson, Gow, & Co.	5	1	3	..	5	6	3
Clay Cross Co.	5	2	6	..	5	3	4
J. & S. Roberts	5	2	6	..	5	5	0
Staveley Coal & Iron Co..	5	3	6	..	5	3	6
Biggs, Wall & Co.....	5	4	9	..	5	4	9
Cochrane & Co.	5	5	0	..	5	10	0
Stanton Iron Works.....	5	6	9	..	5	16	6
Trotter & Sons	5	6	9	..	5	16	6
A. R. Knight.....	5	17	0	..	6	7	6
J. Child	6	17	6	..	7	2	6
R. Laidlaw & Sons	5	10	6	..	5	13	0
British Mannesman Tube Co.	10½d. per foot steel tube.			..	7¾d. per foot steel tube.		

GRIMSBY.—For plumbing work required for new observation block and new discharging ward at the Smallpox Hospital, Laceby. Mr. H. Gilbert Whyatt, A.M.I.C.E., Borough Engineer and Surveyor, Town Hall, Grimsby:—

D. J. Dolby ..	£100	4	6	Goldthorpe & Shuttleworth, Grimsby* ..	£75	10	0
Robinson & Emerson ..	82	2	11				
A. Cook	77	12	11				

GRIMSBY.—For erecting a covered way and lavatories at the Municipal College, for the Education Committee. Mr. H. C. Scaping, architect, Court-chambers, Grimsby:—

F. Swallow, Wellowgate, Grimsby* £274

HEBBURN.—For street works, for the Urban District Council. Mr. H. Paterson, Surveyor, Argyle-street, Hebburn. Quantities by the Surveyor:—

J. MacHarg	£4,456	1	0	J. N. Thompson	£3,427	14	11
J. Wardlaw	4,225	1	5	G. E. Simpson	3,323	6	8
J. Browell..	4,140	0	0	J. Hollings, Wallsend-on-Tyne*..	3,241	10	0
J. S. Short..	3,736	10	1				
J. W. Robson	3,701	15	11				
T. Callaghan	3,644	14	6				
G. Thornton & Co.	3,599	17	6				

[Surveyor's estimate, £3,660 11s. 9d.]

HORLEY.—For the erection of a new council school, for the Surrey Education Committee. Messrs. Jarvis & Richards, Architects to the Surrey Education Committee:—

T. Vaughan & Sons ..	£5,252	1	10	Reeves & Port	£4,457	15	0
A. White & Co.	5,137	13	0	S. Ellis	4,434	0	0
S. W. Gibbs	5,073	19	9	East & Hyde	4,425	0	0
T. S. Page..	4,955	11	3	Strange & Sons	4,400	0	0
Potter Bros.	4,818	0	0	Longley & Co.	4,389	0	0
W. Laker ..	4,757	13	6	R. B. Amos	4,337	2	5
A. F. Vigor & Co.	4,744	0	0	Thomas & Edge	4,316	0	0
A. Hudson & Co.	4,680	0	0	Crosby & Co.	4,299	0	0
Drowley & Co.	4,675	16	0	Denne & Sons	4,272	0	0
Cummins & Son.....	4,672	0	0	Buckland & Waters	4,261	0	0
Grace & Marsh ..	4,651	0	0	S. Knight ..			
J. Smith & Sons	4,650	0	0	J. J. Pink ..	4,246	0	0
T. Wickens	4,601	0	0	J. & M. Patrick.....	4,178	0	0
Martin, Wells, & Co.	4,595	0	0	R. Cook & Sons	4,137	0	0
W. D. Wilkins	4,590	0	0	J. Waters ..	4,134	0	0
Myall & Upson	4,582	0	6	Davey & Jones	4,123	0	0
Mitchell Bros.	4,572	0	0	E. C. Hughes	4,105	0	0
A. King & Son.....	4,551	15	2	Foster Bros.	4,090	0	0
G. Martin ..	4,543	0	0	S. Page & Sons	4,078	0	0
T. G. Sharpington ..	4,530	0	0	Dean & Co.	4,062	0	0
W. Smith & Sons	4,518	0	0	J. Parsons..	4,014	0	0
Lorden & Sons	4,503	0	0	J. G. Pickard	3,944	16	0
				H. Kent ..	3,890	0	0
				F. J. Webb	3,886	16	0

GREAT YARMOUTH.—For 800 tons of steel girder tramway rails, for the Town Council. Mr. J. W. Cockrill, Borough Engineer, Town Hall, Great Yarmouth:—

—	Straight Rails. Price per Ton.	Straight Rails. Total Value.	Curved Rails. Price per Ton.	Curved Rails. Total Value.	Fish-Plates. Price per Ton.	Fish-Plates. Total Value.	Sole-Plates. Price per Ton.	Sole-Plates. Total Value.	Tie-Bars. Price per Ton.	Tie-Bars. Total Value.	Bolts. Price per Ton.	Bolts. Total Value.	Total Tender.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Jacobs Bros. & Co.*	4 17 0	3,880 0 0	5 7 0	133 15 0	5 7 0	267 10 0	5 7 0	69 11 0	10 0 0	210 0 0	10 10 0	105 0 0	4,665 16 0
Le Bass	4 15 0	3,800 0 0	5 17 6	146 17 6	5 17 6	293 15 0	12 10 8	162 18 8	10 10 4	220 17 0	12 10 0	125 0 0	4,749 8 2
A. Penny & Co.....	5 1 6	4,060 0 0	7 1 6	178 17 6	5 11 6	278 15 0	6 0 0	78 0 0	10 15 0	225 15 0	10 0 0	100 0 0	4,919 7 6
Maclellan & Co.	5 6 6	4,260 0 0	5 6 6	133 2 6	6 2 0	305 0 0	8 13 6	112 15 6	9 6 0	195 6 0	13 10 0	135 0 0	5,141 4 0
Barrow Steel Co.	5 4 6	4,180 0 0	5 4 6	130 12 6	6 4 6	311 5 0	15 10 0	201 10 0	9 10 0	199 10 0	15 2 6	151 5 0	5,174 2 6
W. Scott.....	5 12 6	4,500 0 0	5 12 6	140 12 6	10 10 0	525 0 0	8 0 0	104 0 0	9 7 6	196 17 6	18 10 0	185 0 0	5,651 10 0
Partial Quotations.													
N.E. Steel Co.	5 10 0	4,400 0 0	5 10 0	137 10 0	8 12 6	431 5 0	8 12 6	112 2 6	—	—	—	—	—
Bolckow Vaughan & Co.	5 7 6	4,300 0 0	5 7 6	134 7 6	8 0 0	400 0 0	8 0 0	104 0 0	—	—	—	—	—
Steel, Peech, & Tozer ..	6 0 0	4,800 0 0	6 0 0	150 0 0	11 10 0	575 0 0	—	—	—	—	—	—	—
Blakemore & Co.	—	—	—	—	—	—	—	—	9 5 0	194 5 0	12 10 0	125 0 0	—
Guest, Keen, & Nettlefold	—	—	—	—	—	—	—	—	9 7 6	196 17 6	15 0 0	150 0 0	—
Quotations for other Sections of Rails.													
Zadig & Co.	5 4 0	—	—	—	5 12 0	—	—	—	11 0 0	—	4 7 6	—	—
Lorain Steel Co.	5 4 0	—	—	—	6 4 0	—	—	—	—	—	—	—	—
Lorain Steel Co.	5 0 0	—	—	—	6 10 0	—	—	—	—	—	—	—	—

TENDERS.—*Continued on page* 681.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Alters., etc., to Premises, Bridge-st. Downham Market	Co-operative Society	C. S. Bosdet, Sec., St. Helier's, Church-road, Downham Market	Dec. 22
One mile of 3-in. Water Main, Bidborough	Tonbridge R.D.C.	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells	do.
Repair of Embankments, North Side of River Clyde	Glasgow Corporation	Office of Public Works, City-chambers, Glasgow	do.
Sewage Tanks, etc. (Glusburn Sewage Works)	Skipton R.D.C.	H. A. Johnson, Engineer, 15, The Exchange, Bradford	Dec. 24
Sluice Valves, etc.	Runcorn U.D.C.	J. Welding, Surveyor, Town Hall, Runcorn	Dec. 27
5,800 lineal yds. of Water Main	do	do.	do.
185 tons of Cast-Iron Pipes, 12 in. diameter	Manchester Corporation	Secretary, Waterworks Offices, Town Hall, Manchester	do.
3 tons of Special Castings	do.	do.	do.
Removal of House Refuse	Chesterton R.D.C.	J. F. Symonds, 9, Benet-street, Cambridge	Dec. 28
Making-up Roads	Surbiton U.D.C.	J. Bell, Council Offices, Ewell-road, Surbiton	do.
Alteration, etc., of Premises, Market-street South	Hetton Downs Amic. & Indus. Soc.	J. W. Holbrook, Surveyor, Houghton-le-Spring	do.
Extension of Vegetable Market, St. James's Market	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker-bldg., Brewery-st., Bradford	do.
Additions, etc., Girls' Hl. Schl., Frenchgate, Richmond	.....	Clark & Moscrop, Architects, Darlington	do.
Two Steel Hopper Barges	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland Basin, Bristol	Dec. 29
200 tons of Guernsey Granite Spalls	Greenwich Guardians	At the Union Offices	do.
Buildings, Stockwell-street, Glasgow	The Corporation	City Engineer, 64, Cochrane-street, Glasgow	do.
Tools for Carpentry, etc., at Technical College	East Ham Corporation	W. H. Barker, Town Hall, East Ham	do.
One Wooden Cooling Tower	Sunderland Corporation	J. F. C. Snell, M.Inst.C.E., Town Hall, Sunderland	Dec. 30
Work at Basement and Shops (part of Public Hall)	Hull Property Committee	J. H. Hirst, City Architect, Town Hall, Hull	do.
Station Buildings, Dechmont, Uphall	Edinburgh District Lunacy Board	J. & A. Leslie & Reid, C.E., 72A, Great George-street, Edinburgh	do.
Bank Premises, Whitefriargate, Hull	Halifax Commercial Banking Co., Ltd.	J. Watson, F.S.I., Cogan-chambers, Bowlalley-lane, Hull	Dec. 31
Billiard Room, Llanbradach Workmen's Hall	.....	W. Phillips, Rose Mount, Llanbradach	do.
Flags (Twelve Months' Supply)	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Pulling Down Old Buildings	Horfield Court Farm Estate	W. P. Saunders, Arch. and Surv., Rupert-chbrs., Quay-st., Bristol	do.
Formation of Roads and Sewers	do.	do.	do.
Enlarging Church School at Piercebridge	.....	P. Cathrick, The Green, Piercebridge	do.
Shops and Dwellings, 29 and 30, Bridge-st., Exeter	Mr. Troke	R. M. Challice, Architect, 14, Bedford-circus, Exeter	do.
*Granite Setts and Channel Blocks	Wrexham Town Council	Borough Surveyor, Willow-road, Wrexham	do.
Electric Light Installation, West Park Library	Hull Libraries Committee	J. H. Hirst, City Architect, Town Hall, Hull	Jan 2-05
Fittings, West Park Library, Anlaby-road	do.	do.	do.
Flooring and Seating Dining-hall, Kirkdale	Liverpool Select Vestry	H. J. Hagger, Parish Offices, Brownlow-hill, Liverpool	do.
1,016 super. yds. of Concrete Slab Paving	Eton U.D.C.	J. Simmonds, Surveyor, Bridge Trust House, Eton	do.
1,630 ft. run of Guernsey Granite Kerb	do.	do.	do.
1,252 ft. run of Channels, etc.	do.	do.	do.
Alterations and Fittings Darley-street Library	Bradford Corporation	F. E. P. Edwards, City Architect, Brewery-street, Bradford	do.
900 superficial yds. of Ferrumite Flagging	Lurgan Town Council	F. W. Pollock, Town Clerk, Town Hall, Lurgan	do.
100 lineal yds. of Granite Kerbs	do.	do.	do.
20 tons of Granite Setts	do.	do.	do.
500 super. yds. Artificial Stone Pavement	East Dereham U.D.C.	H. G. Hinson, Surveyor, East Dereham	do.
100 tons of Granite Blocks	Blything Guardians	H. A. Mullens, Clerk, Union Workhouse, Bulcamp, Halesworth	do.
*Granite Setts, Flint Gravel, etc.	Borough of Paddington	Borough Surveyor, Town Hall, Paddington, W.	do.
Additions to Elephant and Castle, West Chiltington	King & Sons, Ltd.	C. H. Burstow, Architect, 6, West-street, Horsham	do.
Concrete Storage Tank, etc., Otley Convalescent Home	.....	H. A. Johnson, 15, The Exchange, Bradford	Jan. 3
Schools, Derry	Select Vestry of Christ Church	R. Eccles Buchanan, C.E., Architect, Castle-street, Londonderry	do.
Ironwork for Strong-room, etc., at Workhouse	Belfast Guardians	J. R. Robb, Clerk, Union Workhouse, Belfast	do.
Brickwork for Strong-room at Workhouse	do.	do.	do.
Stores	King's Lynn Corporation	H. J. Weaver, Borough Engineer, Town Hall, King's Lynn	do.
Iron Castings	Bury and District Joint Water Board	R. B. Rigby, Waterworks Manager, Parson's-lane, Bury, Lancs.	do.
830 lineal yds. of Steel Sludge Main, Withington Wks.	Manchester Rivers Committee	W. H. Talbot, Town Clerk, Town Hall, Manchester	do.
Suction Gas Pla., Eng., Pump, etc., Withington Wks.	do.	do.	do.
Making-up, etc., Roads	Wealdstone U.D.C.	H. Walker, Surveyor, Council Offices, Wealdstone, Middlesex	do.
Storage Ground, Shieldhall	Clyde Navigation Trustees	W. M. Alston, 16, Robertson-street, Glasgow	Jan. 4
Sanitary Annexes at Workhouse	North Dublin Guardians	J. O'Neill, Clerk, Board Room, North Dublin Union	do.
Plumbing Work for Workhouse	do.	do.	do.
Steel Material	East Indian Railway Company	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
*1,250,000 Jarrah or Karri Paving Blocks	C.B. of Great Yarmouth	Borough Surveyor, Town Hall, Great Yarmouth	Jan. 5
Radcliffe Road Works	Fleetwood U.D.C.	E. Frobisher, Engineer, Town Hall, Fleetwood	Jan. 6
Extension, etc., of Roads	Manchester Corp. (Withington Com.)	Surveyor to Committee, Town Hall, West Didsbury	do:
Fireclay Goods	Manchester Corporation	C. Nickson, Gas Offices, Town Hall, Manchester	do.
*Erection of Post Office, Chelsea	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
Pier Repairs	Ventnor U.D.C.	E. J. Harvey, Surveyor, Ventnor	do.
Dressed Granite Kerb and Channel	Brighton Corporation	F. J. C. May, Borough Engineer, Town Hall, Brighton	do.
Main Outfall Sewer Works	Wishaw Town Council	W. Rodger, Borough Surveyor, Wishaw	Jan. 7
Station-Master's House, Strathaven	Caledonian Railway Company	Company's Engineer, Buchanan-street Station, Glasgow	Jan. 9
Schools, Stamford Park, Hale	Erith U.D.C.	C. H. Fry, Clerk, District Council Offices, Erith, Kent	do.
Overhead Line Equipment, Poles, etc.	do.	do.	do.
Underground Feeder Cables, Boxes, etc.	do.	do.	do.
Rotary Converters, Transformers, etc.	do.	do.	do.
Switchboards, Cable Connexions, etc.	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Screen & Internal Structure for Public Convenience	do.	do.	do.
Sanitary Fittings for Convenience, Eastmoors	Rathdrum Guardians	G. T. Moore, C.E., 1 and 2, Foster-place, College Green, Dublin	do.
Dispensary, etc., for Dunganstown Dispensary Dis.	Wandsworth Borough Council	Town Clerk, Council House, Wandsworth, S.W.	Jan. 10
*Execution of Works and Supply of Materials	.....	Medley Hall, Architect, 1, Harrison-road, Halifax	do.
House and Studio, Rhodes-street, Halifax	Newton Abbot R.D.C.	S. Segar, Engineer, Union-street, Newton Abbot	do.
Masonry Reservoir for 85,000 gallons	do.	do.	do.
900 ft. of 4-in. Cast-Iron Water Mains	.....	L. T. Griffin, Resident Medical Superintendent	do.
Laundry Engine, etc., Dis. Lun. Asylum, Killarney	Ilford U.D.C.	H. Shaw, Surveyor, Town Hall, Ilford	do.
Making-up Green-lane (South Side)	H.M. Works Commissioners	H.M. Office of Works, Storey's-gate, Westminster, S.W.	Jan. 11
New Post Office at Shorncliffe Camp	Grays Thurrock U.D.C.	A. C. James, Surveyor, High-street, Grays	do.
270 lineal yds. of Wrought-Iron Fencing, etc.	Merthyr Tydfil U.D.C.	J. Llewellin Smith, Architect, 67, High-street, Merthyr Tydfil	do.
Council School, Webster-street, Treharris	Wimbledon Education Committee	The Clerk, Council Offices, Wimbledon, S.W.	do.
*School and Cookery Centre	Clacton U.D.C.	A. R. Robinson, Surveyor, Town Hall, Clacton-on-Sea	do.
One Water Van and One Slop Cart	Borough of Hammersmith	Borough Surveyor, Town Hall, Hammersmith, W.	do.
*Road-making, etc., at Hamlet-gdns. and Ormiston-rd.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Erecting Engineer's Cottages	do.	do.	do.
*Form., etc., New-rd., Remov. Bdry. Wall, N.W. Hos.	Commissioners of H.M. Works, etc.	Post Office, Dorchester	Jan. 12
*New Post Office, Dorchester	.....	W. D. R. Taggart, Architect, Scottish Provident-buildings, Belfast	do.
Vested National Schools, Dee-street, Belfast	R.D.C.	K. Cornerford, Clerk	do.
Thirty-three Labourers' Cottages, Kilkenny	.....	W. Clement Williams, Architect, 29, Southgate, Halifax	Jan. 13
Shops, etc., Commercial-street, Halifax	Evesham R.D.C.	R. E. W. Berrington & Son, Engineers, Wolverhampton	Jan. 14
Broadway Sewerage (4,500 yds. Pipe Sewer)	Port Elizabeth Municipal Corp.	Davis & Soper, 54, St. Mary Axe, London, E.C.	Jan. 16
Electric Plant	Kidderminster Corporation	Willcox & Raikes, Engineers, Union-chbrs., 63, Temple-row, B'ham.	Jan. 20
Engine House, etc. (Water Supply: Contract No. 3)	Borough of Camberwell	Town Clerk, Town Hall, Camberwell, S.E.	Jan. 23
*Footbridge and Approach Road over Surrey Canal	Edinburgh, etc., Gas Commissioners	W. R. Herring, M.Inst.C.E., New-street Gasworks, Edinburgh	Jan. 30
Gasworks Plant and Appliances	.....	L. F. Eagleton, Architect, King-street, King's Lynn	No date.
Block of Buildings, Terrington St. Clement	Primitive Methodist Connexion	F. Holland, Engr., 11, Parkinson's-chbrs., Hustlergate, Bradford	do.
Steam Boiler Chimney at Royal Infirmary, Bradford	Hart Accumulator Co., Ltd.	J. P. Earle, Architect, Norfolk-row, Sheffield	do.
Church, etc., Woodhouse	Mr. J. F. Keogh	Manager, Marshgate-lane, Stratford, London, E.	do.
Cast-Iron Columns and Steel Girders	Hamilton Town Council	H. Shaw, Architect, 5, Westmoreland-street, Dublin	do.
Alters., etc., to Premises, 25, Bachelor's-walk, Dublin		A. Cullen, F.R.I.B.A., Brandon-chambers, Hamilton	do.
Public Library, Hamilton			

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Correspondence and Gen. Clerk (Boro' Engr's. Dept.)	Hackney Borough Council	120*l.* per annum	Jan. 3-05
*Clerk of Works	Brentford U.D.C.	4*l.* 4*s.* per week	do.
*Clerk of the Works	Handsworth U.D.C.	3*l.* 10*s.* per week	Jan. 5
*Junior Draughtsman (Estates and Valuation Dept.)	London C.C	Not stated	Jan. 6
*Headmaster	City of Sheffield Education Com.	500*l.* per annum.	Jan. 18

Those marked with an asterisk (*) are advertised in this number. *Competitions*— · *Contracts*, lv. vi. viii. x. *Public Appointments*, xvi.

TENDERS.—*Continued from page 679.*

KEADY (Co. Armagh).—For erecting new premises, for the Northern Banking Company, Limited. Mr. H. C. Parkinson, architect, Armagh. Quantities by Messrs. W. H. Stephens & Sons, Donegall-square North, Belfast:—

McRoberts & Armstrong	£5,140	H. Laverty & Sons	£5,000
J. Kidd	5,140	R. Calwell	4,900
Courtney & Co.	5,100	W. Dowling*	4,670

[All of Belfast.]

KIRKBY-IN-ASHFIELD.—For the construction of new gasworks, for the Urban District Council. Mr. R. G. Shadbolt, engineer, Gasworks, Grantham:—

R. Dempster & Sons, Ltd., Elland, Yorkshire* £13,894 10 0

LONDON BOARD OF EDUCATION TENDERS.

Lewisham, Sydenham Hill-road (Alterations in Infants' Department).

[That expenditure not exceeding 274*l.* be sanctioned in respect of the execution of additional improvements in the infants' department of the Sydenham Hill-road School; that the work be executed by Messrs. J. & C. Bowyer, contractors for the enlargement of the boys' and girls' departments of this school; and that the actual cost be calculated on completion on their contract schedule of prices for the works in progress.]

Brixton, Hackford-road (Teachers' room).

J. Marsland & Sons	£299	H. Leney & Son	£215
Holliday & Greenwood, Ltd.	293	J. Garrett & Son	213
Maxwell Bros., Ltd.	288	W. J. Coleman & Co., Wynne-rd., Brixton*	185
J. F Ford	223		
E. Trigg	220		

Lewisham, Stillness-road New School (Heating apparatus).

Davis & Bennett	£1,099 0 0
J. Grundy	999 0 0
Werner, Pfleiderer, & Perkins, Ltd.	965 3 4
Stevens & Sons	950 0 0
J. & F. May	840 0 0
A. Macintosh & Sons, Ltd.	835 0 0
J. Defries & Sons, Ltd.	779 15 0
Brightside Foundry & Engineering Co., Ltd., 28, Victoria-st.*	777 0 0

Wandsworth, Hearnville-road New School (Heating apparatus).

J. Grundy	£889 0	Wontner-Smith, Gray, & Co.	£670 0
J. Esson & Son	875 0	Brightside Foundry & Engineering Co., Ltd.	645 0
Stevens & Sons	780 0	G. & E. Bradley, 68 & 70, Elfort-road, Highbury*	587 10
W. G. Cannon & Sons	778 0		
Steele & Co.	693 0		
J. Yetton & Co.	690 0		
Palowkar & Sons	674 0		

Lewisham, Lewisham-bridge (Partitions, etc.).

E. P. Bulled & Co.	£649	J. & C. Bowyer	£557 0
J. Smith & Sons, Ltd.	638	Thomas & Edge	556 0
H. Groves	620	W. Downs, Hampton-street, Walworth-road*	535 0
T. D. Leng	598		
H. Leney & Son	595		

Poplar, Bromley Hall-road (Partitions, etc.).

Parrott & Isom	£1,196	G. Munday & Sons	£687
F. A. Fawkes	899	Vigor & Co.	649
Turnbull & Son	735	J. Grover & Son	623
E. Spencer & Co.	727	F. Bull	621
A. E. Symes	700	W. Lawrence & Son, Canal Works, Waltham Cross*	529
J. T. Robey	700		
H. Bouneau	690		
A. J. Sheffield	687		

Kensington, N., Wornington-road (Partitions, etc.).

W. & C. Brown	£799	R. E. Williams & Sons	£510
W. R. & A. Hide	615	R. S. Ronald	500
Lathey Bros.	553	S. Polden	476
J. & M. Patrick	549	E. Triggs	460
General Builders, Ltd.	537	R. A. Jewell, 30, North-street, Wandsworth*	446
T. Hooper & Son	530		

Deptford, Lucas-street (Store for trustees' furniture).

Rice & Son	£316	H. Groves	£258
C. J. Jerrard	295	J. & C. Bowyer	253
T. D. Leng	286	H. Line 81, Peckham-rye*	249
W. V. Goad	285		
E. Triggs	265		

Poplar, Bromley Hall-road (Adaptation of iron building for physically defective children, etc.).

Parrott & Isom	£499 0	F. Smith & Co.	279 9
J. T. Robey	337 0	A. J. Sheffield	270 0
T. S. Elkington & Sons	328 0	T. J. Hawkins & Co., The Works, Ashford, Middlesex*	210 0
A. Leather	326 0		
Vigor & Co.	320 0		
W. Harbrow	295 0		

Hackney, S., Lamb-lane Special School (Partitions, etc.).

J. Grover & Son	£209	McCormick & Sons, Northampton-st., Essex-road*	£169
A. Porter	203		
J. Stewart	178		
H. Bouneau	174		

Stepney, Settles-street (Reconstructing boiler flue).

J. Grover & Son	£256 0	Stevens Bros.	£216 0
A. J. Sheffield	250 0	Rockhill Bros.	202 10
T. S. Elkington & Sons	240 0	J. Dolman & Co.	198 0
Marchant & Hirst	239 0	Vigor & Co., Kingstreet, Poplar*	176 10
F. Bull	219 0		

Haggerston, Fellows-street (Stoves).

G. Munday & Sons	£148	A. J. Sheffield	£125
M. Pearson	136	Marchant & Hirst	125
G. S. S. Williams & Son	132	Stevens Bros.	123
J. Grover & Son	132	F. Bull, 31, Old Hill-st., Upper Clapton*	122

Fulham, Ackmar-rd. (1. Stepping, etc.; 2. Play-sheds). Poplar, Culloden-street (Play-shed).

	Partition, etc.	Ackmar-road. Play-sheds.	Culloden-street. Play-shed.
W. R. & A. Hide	£123	£175 0	—
J. & M. Patrick	129	159 0	£69
E. B. Tucker	108	158 0	59
S. Polden	105	156 10	60
Lathey Bros., St. George's Works, New-road, Battersea-park*	107	145 0	47
W. Hammond	119	135 0	—
R. S. Ronald	120	120 0	70

Fulham, St. Dunstan's-road (Ventilation works).

E. B. Tucker	£188	W. Hammond	£119
S. Polden	139	Lathey Bros, St. George's Works, New-road, Battersea Park*	107
General Builders, Ltd.	137		
E. Triggs	130		
T. Hooper & Son	129		

Bethnal Green, S.W., Turin-street (Ventilation works).

J. T. Robey	£160	A. J. Sheffield	£88
Vigor & Co.	146	M. Pearson	86
G. S. S. Williams & Son	106	H. Line, 81, Peckhamryo*	77
T. S. Elkington & Sons	99		

Wandsworth, Oak Lodge Residential School for Deaf Girls (External emergency iron staircase).

Ashton & Green Iron Co.	£235 0 0
McDowall, Steven, & Co., Ltd.	202 0 0
E. E. Bailey	162 0 0
A. Ritchie & Co.	159 9 6
St. Pancras Iron Work Co., Ltd. (specification B)	159 0 0
Hayward Bros. & Eckstein, Ltd., 187, Union-street, Borough, S.E.*	156 10 0
St. Pancras Iron Work Co., Ltd. (specification A)	147 10 0

Hoxton, Chatham-gardens (Cleaning).

[(*a*) That the resolution of November 29, accepting the tender of Messrs. C. Dearing & Son for cleaning the interior of the Chatham-gardens School (Hoxton) during the Christmas holidays, be rescinded. (*b*) That the tender of Messrs. Barrett & Power, amounting to 120*l.*, for cleaning the interior of the Chatham-gardens School (Hoxton) during the Christmas holidays, be accepted.—Agreed.]

Battersea, Holden-street (Reinstatement after fire).

[That expenditure not exceeding 450*l.* be sanctioned for carrying out the work of reinstatement after fire at the Holden-street School (Battersea); that the offer of Messrs. Johnson & Co. to carry out the necessary work under the Council's printed schedule of prices, with an addition of 5 per cent. thereto, be accepted.—Agreed.]

Camberwell, N., Credon-road (Sanitary improvements, additional work).

[That additional expenditure, not exceeding 132*l.*, be sanctioned for taking up the defective drains in the girls' playground at the Credon-road School, Camberwell, N., and relaying them in iron with watertight joints, and also for providing new traps and temporary offices; and that the cost of this extra work be calculated as a variation upon the contract of Mr. A. Porter for carrying out sanitary and drainage works at the school.—Agreed.]

Greenwich, Randall-place (Schools for deaf and physically defective children).

Rice & Son	£7,171	J. & C. Bowyer	£6,540
J. Smith & Sons, Ltd.	6,736	J. Longley & Co.	6,428
W. J. Mitchell & Son	6,694	W. Downs	6,280
T. D. Lenz	6,664	G. E. Wallis & Sons, Ltd.	6,238
F. & H. F. Higgs	6,617	Martin, Wells, & Co., Ltd.	6,185
Holliday & Greenwood, Ltd.	6,594	W. Harris, Steam Joinery Works, North Woolwich*	6,178
J. Appleby & Sons	6,584		

[The architect's estimate comparable with these tenders is £6,664.]

LONDON.—For proposed new sorting rooms and offices at the Anglo-American Laundry, Lower Tooting, for Mr. D. Wynter. Plans by Mr. S. J. Reynolds, Reigate. Quantities by Mr. J. Kennard, Croydon:—

Josolyne & Young	£1,875	W. Smith & Son	£1,432
A. Black & Son	1,560	W. Akers & Co., South Norwood*	1,375
Truett & Steel	1,460	D. D. Barker	1,318
A. Funnell & Co.	1,459		

LONDON.—For the manufacture, supply, delivery, and erection of the gas engines required at the new Falcon-brook pumping station, at the junction of York-road and Creek-street, Battersea, for the London County Council:—

The British Westinghouse Co.	£8,140 0
Fielding & Platt	7,355 0
Tangyes Ltd.	6,650 0
Crossley Bros.	5,925 0
Railway and General Engineering Co.	5,500 0
Campbell Gas Engine Co., Halifax*	5 300 0
Acme Engineering Co.	4,896 0
Wenham & Waters, in conjunction with the Acme Engineering Co.	4,341 0
Dougill's Engineering Co., Ltd., & A. Dougill & Co., Ltd.	4,322 10

LONDON.—For the supply, delivery, and erection of the seven cast-iron water tanks required for the first portion of the Greenwich generating-station, for the London County Council:—

T. Lister & Co., Ltd.	£2,847 0 0
Caledonian Engineering & Shipbuilding Co.	2,585 0 0
Eastwood, Swingler, & Co., Ltd.	2,115 10 0
Northamptonshire Direct Castings Co., Ltd.	2,024 8 0
Widnes Foundry Co., Ltd.	1,961 3 3
Ashton & Green Iron Co.	1,928 10 0
Moorwood, Sons, & Co., Ltd.	1,879 9 0
Foster Bros.	1,843 10 0
J. Williamson & Co.	1,804 13 10
Mather & Platt, Ltd.	1,778 4 0
Stanton Iron Works Co., Ltd.	1,727 5 10
J. Cochrane & Sons .... alternative	1,725 10 0 1,630 0 0
H. J. & A. Coulthurst	1,725 9 10
Head, Wrightson, & Co., Ltd.	1,700 18 6
Gimson & Co., Ltd.	1,699 0 0
T. Piggott & Co., Ltd.	1,667 10 0
Westwood & Wrights	1,664 0 0
C. & W. Walker, Ltd.	1,645 9 8
R. Carr & Co.	1,645 4 6
Bennett, Sons, & Shears, Ltd.	1,641 0 0
J. Abbot & Co., Ltd.	1,636 15 0
J. Fraser & Son	1,594 15 0
Ransomes & Rapier, Ltd.	1,577 1 0
Tibbington Foundry Co.	1,568 2 6
W. Lucy & Co., Ltd.	1,564 11 0
E. J. Raybould, Ltd.	1,557 5 0
W. A. Baker & Co., Ltd.	1,551 0 0
J. Oakes & Co.	1,550 15 0
F. Bird & Co.	1,528 0 0
Phœnix Foundry Co., Ltd.	1,517 7 1
Hunt Brothers (Oldbury), Ltd.	1,512 10 0
Spencer & Co., Ltd.	1,492 0 0
Railway and General Engineering Co., Ltd.	1,475 10 0
Clapham Brothers, Ltd.	1,463 2 6
Sheepbridge Coal and Iron Co., Ltd.	1,460 7 6
J. Hands & Sons	1,441 9 5
Patent Shaft and Axle Tree Co., Ltd.	1,436 16 8
J. & R. Houston, Ltd.	1,431 0 0
Newton, Chambers, & Co., Ltd.	1,426 6 4
Holwell Iron Co., Ltd.	1,411 11 11
Whessoe Foundry Co., Ltd.	1,389 0 0
Ashmore, Benson, Peace, & Co., Ltd.	1,381 0 0
Horseley Co., Ltd.	1,375 4 5
British Hydraulic Foundry Co., Ltd.	1,365 1 6
J. W. Harrison	1,343 8 2
A. Macintosh & Sons, Ltd.	1,296 5 0
H. Balfour & Co., Ltd.	1,263 19 5
F. Bradley	1,252 1 1
S. Russell & Sons, Leicester*	1,173 12 0

LONDON.—For the Lewisham Borough Council. Mr. E. Van Putten, C.E., Surveyor, Town Hall, Catford, S.E.:—

Kerbing and Tar-paving the Footpaths and Channelling and Making-up the Roadway of Brockley View.

J. Mowlem & Co., Ltd.	£1,388 0 0	H. Woodham & Sons	£1,241 0 0
B. Martin	1,351 11 8	Fry Bros.	1,215 0 0
		W. Pearce*	1,210 0 0

Kerbing, Channelling, and Making-up the Roadway of Chudleigh-road.

W. J. Logan	£640 0 0	B. Martin	£462 10 9
Fry Bros.	499 0 0	H. Woodham & Sons	462 0 0
F. Hoffmann	487 16 4	W. Pearce*	456 0 0
Harvey Bros.	480 5 4		
J. Mowlem & Co., Ltd.	466 0 0		

Paving the Footways of Chudleigh-road with Artificial Stone.

W. J. Logan	£240 0 0	Harvey Bros.	£191 6 8
F. Hoffmann	207 13 4	Patent Victoria Stone Co., Ltd.	185 0 0
Fry Bros.	207 0 0	J. Ellis & Sons, Ltd.	180 13 7
B. Martin	203 0 0	W. Pearce	180 0 0
J. Mowlem & Co., Ltd.	199 0 0	Empire Stone Co.*	176 9 9
Imperial Stone Co., Ltd.	199 0 0		
H. Woodham & Sons	192 0 0		

Laying Paved Crossings, Kerb, and Channel in the Forest Hill District.

W. Pearce	£1,847 8 0	H. Woodham & Sons	£1,509 14 1½
Fry Bros.	1,625 3 0	Harvey Bros.*	1,425 4 10
J. Mowlem & Co., Ltd.	1,534 17 9		

LONDON.—For the erection of five blocks of dwellings proposed to be erected on the site of the Royal Caledonian Asylum in Caledonian-road, Islington, for the London County Council:—

J. Parsons	£43,217	Kirk & Randall	£39,765
W. Smith & Son	42,880	F. & T. Thorne	39,500
Prestige & Co.	42,115	Martin, Wells, & Co., Ltd.	39,382
Spencer, Santo, & Co.	41,779	Lawrance & Sons	38,584
F. & H. F. Higgs	41,490	Charles Wall, Ltd., Upcerne-road, Chelsea, S.W.*	36,465
H. L. Holloway	40,959		
Holloway Bros. (London), Ltd.	40,000		

[The estimate comparable with the Tenders amounts to £41,004.]

LONDON.—For wiring and fittings for an electric light installation at the new fire station in course of erection at the junction of East and West Ferry roads, Isle of Dogs. For the London County Council:—

Donnison, Sillem, & Co.	£247 10	W. H. Johnson	£183 5
Tamplin & Makovski, Ltd.	245 0	Durell & Co.	179 13
Oliver Clarke & Co.	220 0	A. H. Marshall & Co.	167 0
F. J. Coleby & Co.	197 0	Ward Bros., 28A, Basinghall-street, E.C.*	140 0
National Electric Construction Co., Ltd.	184 0		

SETTLE.—For taking-up 1,100 yds. of old main sewers and altering and reforming same for the Rural District Council. Messrs. Barber, Hopkinson, & Co., engineers, Craven Bank-chambers, Keighley:—

Stoid Bros. & Co., Contractors, Keighley* .. £1,226 4 9

UCKFIELD.—For additions to the National School, for the Managers. Mr. J. Peckham, architect. Quantities by the architect:—

W. Burgess	£530	F. Waters & Son	£389
A. Chilton	500	C. Pelham	385
J. G. Pickard	485	B. Farrant, Uckfield*	364

WAKEFIELD.—For main pipe sewers at Walton and Alverthorpe, for the Rural District Council. Mr. F. Massie, engineer, Tetley House, Kirkgate, Wakefield:—

J. Armitage, Outwood, near Wakefield* £138 6 6

WAKEFIELD.—For erecting a porter's lodge, receiving wards, isolation wards, entrance gates, and new road, for the Guardians. Mr. J. Day, architect, 89, Kirkgate, Wakefield:—

Excavator, Bricklayer, etc.: J. Lockey, Wakefield	£1,888	3	0
Slater: J. W. Illingworth, Wakefield	97	19	8
Plasterers: W. Platts & Co., Wakefield	78	0	0
Carpenters: T. & M. Arundel, East Ardsley, Wakefield	522	2	3
Plumber: J. H. Wilson, Outwood, Wakefield	165	0	0
Electrical: Wakefield Electrical Engineering Co., Wakefield	58	0	0
Painters: Fleming & Born, Wakefield	17	10	0
Heating Engineer: J. Woodhead, Wakefield	415	0	0

WATFORD.—For extension of main sewers at Northwood, for the Rural District Council. Mr. E. Lailey, engineer, 9, Market-street, Watford:—

Clark Bros.	£310	Free & Sons	£242
W. Judge	250	G. R. Mann	222
H. Brown	250	F. P. Bliss, Bushey*	205
Bracey & Clark	244		

WINCOLMLEE.—For the erection of steel and iron work for cart sheds, for the Property Committee of Hull Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

E. F. Blakeley & Co., Liverpool £232

Subject to confirmation by the Council.

WOKING.—For erecting public offices, Commercial-road, for the Urban District Council. Mr. G. J. Wooldridge, architect and surveyor, Bank-chambers, Woking:—

	Monks Pk. Stone.	Portland Stone.
A. A. Gale	£4,848	£5,108
Ferguson & Co.	3,545	4,730
R. Wood	4,363	4,583
Mussellwhite & Sapp	4,352	4,600
C. Wall, Ltd.	4,297	4,385
S. Ellis	4,217	4,477
Higgs & Outhwaite	4,214	4,357
Martin, Wells, & Co.	4,200	4,450
E. Chamberlain	4,145	4,315
Cropley Bros.	4,099	4,274
J. Harris & Son	4,094	4,373
Shelbourne & Co.	4,013	4,155
J. & N. Patrick	4,003	4,189
Drowley & Co., Woking*	3,979	4,262
E. C. Hughes	3,943	4,159

WOKINGHAM (Berks).—For erecting new schools, for the Berkshire Education Committee. Mr. F. C. Pinks, architect, Parliament-mansions, Victoria-street, London, S.W.:—

H. W. Godwin	£7,417	9	10
S. Orchard & Son	7,337	0	0
J. Ferguson & Co.	6,687	10	0
Mitchell Bros.	6,519	0	0
C. W. Cox & Sons	6,445	0	0
T. Stimson & Sons	6,438	2	3
S. Lewis & Son	6,422	0	0
H. Charman	6,414	0	0
Foster Bros.	6,404	0	0
S. Ellis	6,371	0	0
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